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Third report on the protection of the atmosphere

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I. Introduction

1. At its sixty-seventh session in 2015, the International Law Commission had before it the second report submitted by the Special Rapporteur on the topic of the protection of the atmosphere (A/CN.4/681 and Corr.1 (Chinese only)). The report contained proposals for five draft guidelines regarding the use of terms, scope of the guidelines, common concern of humankind, general obligation of States and international cooperation.

2. The second report was considered by the Commission during its 3244th to 3249th meetings, held on 4 to 8 and 12 May 2015. In addition, the Commission held an informal meeting in the form of a dialogue with scientists organized by the Special Rapporteur on 7 May 2015, which members of the Commission found useful and of which they were appreciative.[1]

3. The Commission decided to send to the Drafting Committee all the draft guidelines proposed by the Special Rapporteur, except draft guideline 4 on the general obligation of States to protect the atmosphere, which the Special Rapporteur did not ask to have considered by the Drafting Committee. When sending the draft guidelines to the Drafting Committee, the Commission also agreed that draft guideline 3 on the common concern of humankind be moved to the preambular section of the draft guidelines. The Drafting Committee recommended that the expression "common concern of humankind" should be changed to "pressing concern of the international community as a whole", and it was included in the preamble in that form. The Drafting Committee also recommended draft guideline 1 on the use of terms (namely, "atmosphere", "atmospheric pollution" and "atmospheric degradation"), draft guideline 2 on the scope, and draft guideline 5 on international cooperation for adoption by the Commission. The Commission provisionally adopted the preamble and the draft guidelines, with the commentaries thereto, at its sixty-seventh session.[2]

Debate held by the Sixth Committee of the General Assembly at its seventieth session

4. In November 2015, during the seventieth session of the General Assembly, the Sixth Committee considered the Special Rapporteur's second report and the work of the Commission on the topic. The delegations generally welcomed the work of the

[1] The dialogue with scientists on the protection of the atmosphere was chaired by the Special Rapporteur. Prof. Øystein Hov (President, Commission of Atmospheric Sciences, WMO) spoke on "Scientific aspects of the atmosphere: A General Overview", Prof. Peringe Grennfelt (Chair of the Working Group on Effects, CLRTAP, UNECE) on "Trans-continental transport of pollutants and their effects", Mr. Masa Nagai (Deputy Director, Division of Environmental Law and Conventions, UNEP) on "Pollutants affecting the global environment through the atmosphere", Mr. Christian Blondin (Director of Cabinet and External Relations Department, WMO) on "The role of the atmosphere in the global climate" and Ms. Jacqueline McGlade (Chief Scientist and Director, Division of Early Warning and Assessment, UNEP) on overall issues on atmospheric pollution and atmospheric degradation. Ms. Albena Karadjova (Secretary to CLRTAP, UNECE) also spoke on the economic implication of transboundary atmospheric pollution. For a summary of the meeting, see the UNEP document: Charles Wharton, "UN ILC's Dialogue with Scientists on the protection of the atmosphere", available at www.unep.org/delc/Events/montevideo-events/tabid/1060317/Default.aspx.

[2] *Official Records of the General Assembly, Seventieth session, Supplement No. 10 (A/70/10)*, chap. V, paras. 45-54.

Commission,[3] while a few delegates remained sceptical.[4] Most delegations expressed their endorsement of the collaboration of the Commission with atmospheric scientists in pursuing the work on the topic.[5]

5. With regard to the concept of "common concern of humankind" proposed by the Special Rapporteur, most delegations expressed agreement with changing the term to the "pressing concern of the international community as a whole" and placing it in the preamble,[6] while other delegations preferred to retain the original term.[7] One delegation stated that, instead of "pressing concern", "[a] more positive signal would be sent by referring to the concept of 'care' rather than using words that expressed anxiety."[8] Regarding draft guideline 1 (b), some delegations wondered whether the definition of "atmospheric pollution" should be restricted to activities having transboundary effects.[9] Some delegations also questioned whether it was appropriate to delete the word "energy" in the definition, in view of the fact that article 1 (1) (b) of the United Nations Convention on the Law of the Sea explicitly referred to "energy" as a cause of pollution.[10] One delegation favoured inclusion of a reference to the significant adverse effects to living resources in draft guideline 1 (c).[11] It was also suggested by another delegation that the word "global" be inserted before "atmospheric conditions" in the definition of "atmospheric degradation" in draft guideline 1 (c) in order to "make it clear that the atmospheric degradation referred to was the alteration of atmospheric conditions to such an extent that they produced worldwide deleterious effects."[12]

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[3] Finland (on behalf of the Nordic countries, *Official Records of the General Assembly, Seventieth session, Summary records, Sixth Committee*, A/C.6/70/SR.17, para. 36), Singapore (SR.17, para. 46), Italy (SR.17, para. 57), Belarus (SR.17, para. 68), Austria (SR.17, para. 81), Romania (SR.17, para. 102), Israel (SR.18, para. 4), Federated States of Micronesia (SR.18, para. 11), China (SR.18, para. 17), Japan (SR.18, para. 25), India (SR.18, para. 29), Islamic Republic of Iran (SR.18, para. 32), Sri Lanka (SR.18, para. 40), El Salvador (SR.18, para.47), Poland (SR.18, para. 63), Thailand (SR.18, para. 67), South Africa (SR.18, para. 73), Viet Nam (SR.18, para. 78), Republic of Korea (SR.18, para. 81), Malaysia (SR.19, para. 10), Germany (SR.19, para. 12), Philippines (SR.19, para. 15), Portugal (SR.19, para. 24), Algeria (SR.19, para. 34), Argentina (SR.19, para. 42), France (SR.20, para. 15), Hungary (SR.21, para. 81).

[4] Czech Republic (A/C.6/70/SR.17, para. 93), United Kingdom (SR.18, para. 10), Russian Federation (SR.19, para. 5), United States (SR.18, para. 18), Slovakia (SR.19, para. 31).

[5] Finland (on behalf of the Nordic countries, A/C.6/70/SR.17, para. 36), Singapore (SR.17, para. 46), Belarus (SR.17, para. 68). Austria, for instance, welcomed "the dialogue which the Commission had had with scientists, thereby promoting a better understanding of the complex physical phenomena involved" (SR.17, para. 81). One delegation however cautioned that "such dialogues might sometimes give rise to misleading conclusions, especially in the case of topics in which many important elements were defined by physics or other natural sciences, and not by the law" (Slovakia, SR.19, para. 31).

[6] Finland (on behalf of the Nordic countries, A/C.6/70/SR.17, para. 36), Singapore (SR.17, para. 46), Israel (SR.18, para.4), China (SR.18, para. 18), Japan (SR.18, para. 25), Sri Lanka (SR.18, para. 41), Poland (SR.18, para. 63), Republic of Korea (SR.18, para. 81), France (SR.20, para. 15).

[7] Federated States of Micronesia (A/C.6/70/SR.18, paras. 13-15), Germany (SR.19, para. 12), Portugal (SR.19, para. 24).

[8] Belarus (A/C.6/70/SR.17, para. 20).

[9] Finland (on behalf of the Nordic countries, A/C.6/70/SR.17, para. 37), Austria (SR.17, para. 81), Poland (SR.18, para. 64).

[10] Austria (A/C.6/70/SR.17, para. 82), Poland (SR.18, para. 64).

[11] Romania (A/C.6/70/SR.17. para. 102).

[12] China (A/C.6/70/SR.18, para. 18).

6. With regard to draft guideline 2, delegations generally welcomed the fact that the scope of the guidelines was clearly delineated by it.[13] However, one delegation suggested that a "'without prejudice clause' would be more helpful and appropriate than the exclusion of specific substances from the project's scope."[14] It was stated by one delegation that, in view of the fact that "most health problems were caused by particulate matter, including black carbon and tropospheric ozone, those pollutants should also be included in the scope of the draft guidelines", and that "thought might be given to enlarging its scope or even elaborating a new, global convention on air pollution."[15] In regard to the 2013 understanding,[16] one delegation expressed its belief that the reference to political negotiations was not necessary and should be removed from draft guideline 2 and from the general commentary.[17] Another delegation sought clarification of the logic behind the double-negative "do not deal with" followed by "but without prejudice to" in the understanding.[18]

7. Regarding draft guideline 5 on international cooperation, delegations generally supported it, together with the wording "as appropriate".[19] A few delegations noted, however, that the wording should be reconsidered.[20] Some States expressed the view that the scope of cooperation in guideline 5 was too limited[21] and should be expanded beyond scientific knowledge to "other areas, such as regulatory institutions and international emergency actions and communications" as well as to "promoting technical cooperation, such as the exchange of experiences and capacity building".[22] It was suggested that it might be possible to follow the provisions of the relevant draft articles of the Commission on the topic of prevention of transboundary harm.[23]

Information provided by Member States

8. In chapter III of its report on the work of its sixty-seventh session, the Commission indicated that it would welcome any information relevant to the topic.[24] Information on domestic legislation was received from Singapore on 30 January 2016.[25]

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[13] Italy (A/C.6/70/SR.17, para. 57), China (SR.18, para. 17), Poland (SR.18, para. 65), Republic of Korea (SR.18, para. 83).

[14] Islamic Republic of Iran (A/C.6/70/SR.18, para. 32).

[15] Hungary (A/C.6/70/SR.21, paras. 81-82).

[16] *Official Records of the General Assembly, Sixty-eighth session, Supplement No. 10* (A/68/10), chap. XII, para. 168.

[17] El Salvador (A/C.6/70/SR.18, para. 49).

[18] Philippines (A/C.6/70/SR.19, para. 15).

[19] Finland (on behalf of the Nordic countries, A/C.6/70/SR.17, para. 38), Sri Lanka (SR.18, para. 41). Singapore stressed also that the principle of "good faith" should be articulated in the commentary (SR.17, para. 48).

[20] E.g. Belarus (A/C.6/70/SR.17, para. 72).

[21] E.g. El Salvador (A/C.6/70/SR.18, para. 48).

[22] Singapore (A/C.6/70/SR.17, para. 50). Other States expressed a similar view: Islamic Republic of Iran (SR.18, para. 35), Malaysia (SR.19, para. 11), Algeria (SR.19, para. 34).

[23] Russian Federation (A/C.6/70/SR.19, para. 7).

[24] *Official Records of the General Assembly, Seventieth Session, Supplement No. 10* (A/70/10), para. 24.

[25] "Information on domestic legislation of Singapore: Transboundary Haze Pollution Act of 2014". This legislation is referred to in para. 32 and footnote 96 of the present report.

Recent developments

9. The United Nations summit for the adoption of the post-2015 development agenda was held from 25 to 27 September 2015 in New York and convened as a high-level plenary meeting of the General Assembly. It formally adopted the post-2015 development agenda, entitled "Transforming our world: the 2030 Agenda for Sustainable Development",[26] to guide the development of the international community over the next 15 years. As such, it called for action by all countries for all people in five areas of critical importance: people, planet, prosperity, peace and partnership. Throughout the summit, heads of State and government welcomed the 2030 Agenda for Sustainable Development and emphasized its transformative, universal and inclusive nature, its applicability to all countries and stakeholders and its motto of leaving no one behind.[27] The Agenda includes 17 Sustainable Development Goals with 169 associated targets,[28] covering a wide range of issues, including combating climate change, which are integrated and indivisible, to replace the Millennium Development Goals.[29]

10. At its twenty-first session, held in Paris from 30 November to 12 December 2015, the Conference of the Parties to the United Nations Framework Convention on Climate Change[30] adopted the Paris Agreement under the Convention with no objections from the 196 parties,[31] which is regarded as a new chapter for humankind in tackling climate change issues after 2020. In the Paris Agreement, the parties to the Convention, acknowledging that "climate change is a common concern of humankind",[32] dealt with, inter alia, mitigation, adaptation, loss and damage, finance, technology development and transfer, capacity-building, and transparency of action and support. The Paris Agreement aims to hold "the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursues efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels" (article 2 (1) (a)).[33] It is significant that the Paris Agreement, pursuant to the Durban Platform for Enhanced Action, obliges "all parties" to undertake the commitments made thereunder (article 3).

Purpose of the present report

11. Building on the previous two reports, the Special Rapporteur wishes to consider, in the present (third) report, several key issues of the topic, namely, the obligations of States to prevent transboundary atmospheric pollution and mitigate global atmospheric degradation and the requirement of due diligence and environmental impact assessment (see section II below). He also explores the principle of sustainable and equitable utilization of the atmosphere and the legal

[26] A/RES/70/1.

[27] See the overview in "Informal Summary on United Nations Summit on Sustainable Development 2015", at https://sustainabledevelopment.un.org/content/documents/8521Informal%20Summary%20-%20UN%20Summit%20on%20Sustainable%20Development%202015.pdf. See Birgit Lode et al., "Clean Air for All? Air Quality in the 2030 Agenda, and in International Law", *Review of European, Comparative and International Environmental Law*, vol. 25, No. 2 (forthcoming, 2016).

[28] General Assembly resolution 70/1, para. 59. See also paras. 12, 31, 49 and 73.

[29] General Assembly resolution 55/2.

[30] See http://unfccc.int/meetings/paris_nov_2015/session/9057.php.

[31] FCCC/CP/2015/L.9/Rev.1.

[32] Ibid., annex, preamble.

[33] Ibid., annex, article 2 (1) (a).

limits on certain activities aiming at intentional modification of the atmosphere (see section III below).

II. Obligations of States to protect the atmosphere

A. The duty to prevent transboundary atmospheric pollution

12. In his second report in 2015 (A/CN.4/681), the Special Rapporteur proposed draft guideline 4 on the "General obligation of States to protect the atmosphere", stipulating in a straightforward form that "States have the obligation to protect the atmosphere". That was modelled on article 192 of the United Nations Convention on the Law of the Sea, which provides that "States have the obligation to protect and preserve the marine environment".[34] The Special Rapporteur's characterization of this obligation as an "obligation *erga omnes*" was a point of debate in the Commission[35] and in the Sixth Committee,[36] which was not resolved. The proposed guideline was supported by some members of the Commission,[37] while others expressed objections on the grounds that it was "too open-ended and general".[38] To address the criticism of some members, the Special Rapporteur proposes in the present report to differentiate between two dimensions of the protection of the atmosphere, one on transboundary atmospheric pollution and the other on global atmospheric degradation. That division corresponds to the definitions provisionally adopted by the Commission in draft guideline 1, paragraphs (2) and (3), respectively.

13. The maxim *sic utere tuo ut alienum non laedas* (use your own property in such a manner as not to injure that of another) has been accepted in inter-State relations as the principle that the sovereign right of a State to use its territory is circumscribed by an obligation not to cause injury to, or within, the territory of another State.[39] That maxim has become the basis for the so-called "no harm rule", a prohibition of harmful transboundary impacts in the context of air pollution, most

[34] See A/CN.4/681, paras. 41-59.

[35] Critical views were expressed by Murphy (A/CN.4/SR.3246), Hassouna (SR.3247), Kittichaisaree (SR.3247) and McRae (SR.3248), while Maina Peter stated that he "could live with the Special Rapporteur's proposal, which was likely to garner more general support", noting that "once it had been agreed that the atmosphere was an area of common concern of mankind, there was an obligation on all States to protect it. Furthermore, the very nature of the atmosphere, which was in constant movement around the Earth, militated in favour of such an obligation" (SR.3247). Nolte was not convinced that "theoretical developments regarding the nature of obligations *erga omnes* were really helpful and even feared that they went too far" (SR.3246).

[36] Federated States of Micronesia supporting "a normative statement that imposed *erga omnes* obligations" (SR.18, para. 15). Islamic Republic of Iran drew attention to "the case law of the International Tribunal for the Law of the Sea that might be replicated for the purpose of the protection of the atmosphere", citing the advisory opinion of 1 February 2011 on responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area, which referred to the *erga omnes* character of the obligations under article 137 of UNCLOS (SR.18, para. 34).

[37] Nolte (A/CN.4/SR.3246), Hmoud (SR.3247), Comissario-Afonso (SR.3247), Peter (SR.3247), Candioti (SR.3248), Vasquez-Bermudez (SR.3248).

[38] Park (A/CN.4/SR.3244), Murphy (SR.3246), Wood (SR.3247), Hassona (SR.3247), Kittichasaree (SR.3247), Sturma (SR.3247), Petric (SR.3247), Jacobsson (SR.3248), Escobar-Hernandez (SR.3248), McRae (SR.3248).

[39] Jutta Brunnée, "*Sic utere tuo ut alienum non laedas*", in *Encyclopedic of Public International Law*, vol. IX (Oxford: Oxford University Press, 2012), p. 188.

notably in the famous 1938-41 *Trail Smelter Arbitration*, in which the tribunal confirmed the existence of the rule in international law, stating as follows:

> "... under the principles of international law, ... no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."[40]

14. The *Trail Smelter* case was a traditional type of transboundary air pollution dispute — one in which the cause of the damage and its effects were sufficiently identifiable. That decision is frequently cited in support of the view that, under international law, States are obligated to ensure that activities within their jurisdiction or control do not cause transboundary damage when the injury is foreseeable, as supported "by clear and convincing evidence".[41] Thus, the *sic utere tuo ut alienum non laedas* principle has been recognized as customary international law as applied to the relationship with an "adjacent State" sharing a common territorial border. That rule was confirmed in principle 21 of the 1972 Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration),[42] and reconfirmed, in a slightly modified form, in principle 2 of the 1992 Rio Declaration on Environment and Development.[43] In those Declarations, which provided for the duty of States "to ensure that activities within their jurisdiction or control do not cause damage to the environment of *other* States or of areas beyond the limits of national jurisdiction" (emphasis added), the scope of application of that principle has been broadened to the relationship with long-range transboundary causes and effects between the State of origin and the affected States. The same "no harm rule" has been endorsed in a large number of conventions relating to transboundary air pollution, such as the 1979 Convention on Long-range Transboundary Air Pollution.[44]

1. Prevention

15. As a corollary of the *sic utere tuo* principle, the principle of prevention (obligation of States to take preventive measures) is recognized as a rule of

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[40] United Nations, *Reports of International Arbitral Awards*, vol. III, pp. 1907 f. (Award of 1941), at 1965; See A/CN.4/667, para. 43. See also A. K. Kuhn, "The Trail Smelter Arbitration, United States and Canada", *American Journal of International Law*, vol. 32 (1938), pp. 785-788; ibid., vol. 35 (1941), pp. 665-666; J. Read, "The Trail Smelter Dispute", *Canadian Yearbook of International Law*, vol. 1 (1963), pp. 213-229.

[41] Award, ibid., p. 1965.

[42] Adopted at Stockholm on 16 June 1972, see *Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972* (A/CONF.48/14/Rev.1), part one, chap. I. See Louis B. Sohn, "The Stockholm Declaration on the Human Environment", *Harvard International Law Journal*, vol. 14 (1973), pp. 485-493.

[43] Adopted at Rio de Janeiro on 14 June 1992, see *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, A/CONF.151/26/Rev.1 (vol. I), p. 3; See Leslie-Anne Duvic-Paoli and Jorge E. Vinuales, "Principle 2: Prevention", in Jorge E. Vinuales, ed., *The Rio Declaration on Environment and Development: A Commentary* (Oxford, Oxford University Press, 2015), pp. 107-138.

[44] *United Nations Treaties Series*, vol. 1302, p. 217.

customary international law in the context of transboundary atmospheric pollution.[45] That principle is regarded as consisting of two different obligations, one being the obligation to "prevent" before actual pollution or degradation occurs, and the other the duty to "eliminate", "mitigate" and "compensate" after they have already occurred. For example, article 7 of the 1997 Convention on the Law of Non-navigational Uses of International Watercourses, under the heading "Obligation not to cause significant harm", provides both for the obligation to prevent (paragraph 1) and the obligation to compensate if harm nevertheless occurred (paragraph 2).[46] In that context, more weight is given to the prevention of predictable future damage than to the reparation for damage which has already occurred. The Commission has recognized that in its previous work on the prevention of transboundary harm from hazardous activities "the emphasis upon the duty to prevent, as opposed to the obligation to repair, remedy or compensate, has several important aspects. Prevention should be a preferred policy because compensation in case of harm often cannot restore the situation prevailing prior to the event or accident. ... In any event, prevention as a policy is better than cure."[47] The International Court of Justice has emphasized prevention as well. In the *Gabčikovo-Nagymaros project* case, the Court stated that it "is mindful that, in the field of environmental protection, vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage".[48] In the *Iron Rhine Railway* case, the arbitral tribunal also stated that "Today, in international environmental law, a growing emphasis is being put on the duty of prevention".[49]

16. The Commission has dealt with the obligation of prevention in its 2001 articles on responsibility of States for internationally wrongful acts. Article 14, paragraph 3 provides that "The breach of an international obligation requiring a State to prevent a given event occurs when the event occurs and extends over the entire period during which the event continues ...". According to the commentary, "Obligations of prevention are usually construed as best efforts obligations, requiring States to take all reasonable or necessary measures to prevent a given event from occurring, but without warranting that the event will not occur".[50] The commentary illustrated "the obligation to prevent transboundary damage by air pollution, dealt with in the *Trail Smelter* arbitration" as one of the examples of the obligation of prevention.[51]

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[45] Gunther Handl, "Transboundary Impacts", in Daniel Bodansky, et al., eds., *Oxford Handbook of International Environmental Law* (Oxford: Oxford University Press, 2007), pp. 532, pp. 538-540; Nicolas de Sadeleer, "The principle of prevention and precaution in international law: two heads of the same coin?" in Malgosia Fitzmaurice, et al., eds., *Research Handbook on International Environmental Law* (Cheltenham: Edward Elgar, 2010), pp. 182-199.

[46] General Assembly resolution 51/229, annex.

[47] *Yearbook of the International Law Commission, 2001*, vol. II, Part Two, p. 148, para. (2).

[48] *Gabčikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997*, p. 78, para. 140.

[49] Award in the Arbitration regarding the Iron Rhine ("Ijzeren Rijn") Railway between the Kingdom of Belgium and the Kingdom of the Netherlands, decision of 24 May 2005, UNRIAA, vol. XXVII, p. 116, para. 222.

[50] *Yearbook ... 2001*, vol. II, Part Two, p. 62, para. 14.

[51] Ibid.

2. Due diligence

17. The principle of prevention in environmental law is based on the concept of due diligence. Significant adverse effects on the atmosphere are caused, in large part, by the activities of individuals and private industries, which are not normally attributable to a State. In that respect, due diligence requires States to ensure that such activities within their jurisdiction or control do not cause significant adverse effects. That does not mean, however, that due diligence applies solely to private activities. The activities of a State are also subject to the due diligence rule.[52]

18. Due diligence is an obligation to make best possible efforts in accordance with the capabilities of the State controlling the activities. Therefore, even where actual adverse effects materialize, that does not automatically constitute a failure of due diligence. Such failure is limited to the negligence of the State in meeting its obligation to take all appropriate measures to control, limit, reduce or prevent human activities where those activities have or are likely to have significant adverse effects. The obligation of States "to ensure" does not require the achievement of a certain result (obligation of result) but only requires the best available efforts not to cause adverse effects (obligation of conduct). In that sense, it does not guarantee that the harm would never occur.[53]

19. In its previous work analysing the due diligence standard, the Commission considered it to be "a diligence proportioned to the magnitude of the subject and to the dignity and strength of the power which is to exercise it"[54] or "to be appropriate and proportional to the degree of risk of transboundary harm in the particular instance".[55] Accordingly, "activities which may be considered ultra-hazardous require a much higher standard of care in designing policies", which is an absolute standard.[56] In the case of activities relating to the atmosphere, the required standard of care is set according to the scale and magnitude of a planned activity in the particular instance on the one hand, and the significance and irreparability of the adverse effects which that activity is expected to cause, or is likely to cause on the other hand.

3. Knowledge or foreseeability

20. A State may be deemed to have failed in its duty of due diligence only if it knew or ought to have known that the particular activities would cause significant

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[52] Ibid., p. 154, para. 7 ("The obligation of the State of origin to take preventive ... measures is one of due diligence"); *Pulp Mills on the River Uruguay (Argentina* v. *Uruguay), Judgment, I.C.J. Reports 2010*, p. 55, para. 101 ("the principle of prevention, as a customary rule, has its origins in the due diligence"). See generally on due diligence, Duncan French (Chair) and Tim Stephens (Rapporteur) of the International Law Association Study Group on Due Diligence, "First report on due diligence in international law", pp. 1-33 (2014), available from http://www.ila-hq.org/en/study-groups/index.cfm/cid/1045.

[53] Although the principle to prevent is referred to as "no harm rule", that term is somewhat misleading, Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law and the Environment*, 3rd ed. (Oxford: Oxford University Press, 2009), p. 137. In relation to obligations of result and obligations of conduct, see generally Pierre-Marie Dupuy, "Reviewing the Difficulties of Codification: On Ago's Classification of Obligations of Means and Obligations of Result in Relation to State Responsibility", *European Journal of International Law*, vol. 10 (1999), 371-385. See also S. Murase, *International Law: An Integrative Perspective on Transboundary Issues* (Tokyo: Sophia University Press, 2011), pp. 113-115.

[54] Yearbook ..., 1994, vol. II, Part Two, p. 103, para. (4).

[55] Ibid., ... *2001*, vol. II, Part Two, p. 154, para. 11.

[56] Ibid.

harm to other States.[57] As observed by the International Court of Justice in the *Corfu Channel* case, it is "every State's obligation not to allow *knowingly* its territory to be used for acts contrary to the rights of other States" (emphasis added).[58] The use of the word "knowingly" in this case clarifies a key subjective condition of due diligence. The Court then associated the condition of knowledge with the concept of control and stated that:

> "It is true, as international practice shows, that a State on whose territory or in whose waters an act contrary to international law has occurred, may be called upon to give an explanation. ... But it cannot be concluded from the mere fact of the control exercised by a State over its territory and waters that that State necessarily knew, or ought to have known, of any unlawful act perpetrated therein ..."[59]

21. In the area of international environmental law, the knowledge required of a State is intimately connected with the obligation to carry out an environmental impact assessment. An environmental impact assessment is "one of the central mechanisms used by states to acquire knowledge respecting the environmental consequences of their actions",[60] and "addresses foreseeability by requiring project proponents to comprehensively analyse the likely impacts of proposed activities, including trans-boundary impacts".[61] As the International Court of Justice pointed out in the *Pulp Mills* case, "due diligence, and the duty of vigilance and prevention which it implies, would not be considered to have been exercised, if a party ... did not undertake an environmental impact assessment on the potential effects of such works".[62] The Court, in the recent cases of *Certain Activities carried out by Nicaragua in the Border Area* and *Construction of a Road in Costa Rica along the San Juan River*, also stated that "to fulfil its obligation to exercise due diligence in preventing significant transboundary environmental harm, a State must, before embarking on an activity having the potential adversely to affect the environment of another State, ascertain if there is a risk of significant transboundary harm, which would trigger the requirement to carry out an environmental impact assessment".[63] The Court continued that "to conduct a preliminary assessment of the risk posed by an activity is one of the ways in which a State can ascertain whether the proposed activity carries a risk of significant transboundary harm".[64] Since the Court concluded in the *Pulp Mills* case that "it may now be considered a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant

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[57] Ibid., *1994*, vol. II, Part Two, p. 104, para. 8.

[58] *Corfu Channel Case, Judgment of April 9th, 1949, I.C.J. Reports 1949*, p. 22. Karine Bannelier, "Foundational Judgment or Constructive Myth? The Court's Decision as a Precursor to International Environmental Law". in Karine Bannelier, Theodore Christakis and Sarah Heathcote, eds., *The International Court of Justice and the Evolution of International Law: The Enduring Impact of the Corfu Channel Case* (New York: Routledge, 2012), pp. 246-247.

[59] *Corfu Channel Case, Judgment*, p. 18.

[60] Neil Craik, *The International Law of Environmental Impact Assessment* (Cambridge: Cambridge University Press, 2008), p. 64.

[61] Ibid.

[62] *Pulp Mills on the River Uruguay, Judgment*, p. 83, para. 204.

[63] *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica* v. *Nicaragua)* and *Construction of a Road in Costa Rica along the San Juan River (Nicaragua* v. *Costa Rica), Judgment, I.C.J. Reports 2015*, paras. 104, 153.

[64] Ibid., para. 154.

adverse impact in a transboundary context, in particular, on a shared resource",[65] it can be concluded from the fact of an environmental impact assessment carried out by a State that the State necessarily knew, or ought to have known, of a risk of significant transboundary harm.

4. Degree of care

22. Since due diligence requires States to "act" so as not to cause significant transboundary harm, it is necessary to clarify the degree of care required of a State, that is, the extent to which the behaviour of a State in a set of given circumstances discharges the due diligence obligation.[66] While the condition of knowledge is a subjective element of due diligence, the degree of care constitutes an objective element. Those are cumulative conditions. In the theory and practice of international environmental law, two categories of degree of care exist: "generally accepted international standards" on the one hand and "best practicable means" on the other hand.[67]

23. The former criteria, generally accepted international standards, are "internationally agreed minimum standards set out in treaties or in the resolutions and decisions of international bodies".[68] For example, articles 207, 208, 210-212 of the United Nations Convention on the Law of the Sea provide for "*generally accepted* rules and *standards* established through the competent international organization or general diplomatic conference" (emphasis added). Those provisions can incorporate recommendations and resolutions of international organizations, such as the International Maritime Organization (IMO), into the obligations of the treaty by reference.[69] Quite apart from their incorporation by treaty, such criteria may require to be recognized as having the force of customary international law by virtue of the obligation of due diligence if international support is sufficiently widespread and representative.[70]

24. The latter criteria require States to employ the best practicable means available to them at their disposal and in accordance with their capabilities, so as to prevent transboundary harm so far as possible.[71] A typical example is article 194, paragraph 1, of the United Nations Convention on the Law of the Sea which provides that "States shall take ... all measures ... that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose *the best practicable means at their disposal and in accordance with their capabilities* ..." (emphasis added). In the application of that criterion, the regulatory capacity and technology of the State concerned are taken into account, so that a differentiated degree of care for different States is allowed.[72] The Commission confirmed such

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[65] *I.C.J. Reports 2010*, p. 83, para. 204. See also para. 55 below.
[66] Pierre-Marie Dupuy, "Due diligence in the international law of liability", in *Legal Aspects of Transfrontier Pollution* (Paris: OECD, 1977), pp. 369-379.
[67] Birnie, Boyle and Redgwell, *International Law and the Environment*, op. cit., pp. 148-150; Ilias Plakokefalos, "Prevention obligations in international environmental law", *Yearbook of International Environmental Law*, vol. 23 (2012), pp. 3-43, at 32-36.
[68] Ibid. (Birnie, Boyle and Redgwell), p. 149.
[69] Alan Boyle and Christine Chinkin, *The Making of International Law* (Oxford: Oxford University Press, 2007), p. 219.
[70] Birnie, Boyle and Redgwell, op. cit., p. 150.
[71] Ibid., p. 149.
[72] Ibid. See also Ilias Plakokefalos, "Prevention Obligations in International Environmental Law", *Yearbook of International Environmental Law*, vol. 23 (2012), at 32-36.

consideration in its work on the Prevention of Transboundary Harm from Hazardous Activities, stating that:

> "the degree of care in question is that expected of a good Government. It should possess a legal system and sufficient resources to maintain an adequate administrative apparatus to control and monitor the activities. It is, however, understood that the degree of care expected of a State with a well-developed economy and human and material resources and with highly evolved systems and structures of governance is different from States which are not so well placed. Even in the latter case, vigilance, employment of infrastructure and monitoring of hazardous activities in the territory of the State, which is a natural attribute of any Government, are expected."

Therefore, to fulfil the duty of due diligence under general international law, States are required to use the best practicable means at their disposal and in accordance with their capabilities.

25. As regards the temporal scope of application, the Commission has affirmed in its previous work that "The duty of prevention based on the concept of due diligence is not a one-time effort but requires continuous effort. This means that due diligence is not terminated after granting authorization for the activity and undertaking the activity; it continues ... as long as the activity continues."[73] In that regard, the content of "due diligence" is not static, and the degree of care may change over time. The Commission stated that "What would be considered a reasonable standard of care or due diligence may change with time; what might be considered an appropriate and reasonable procedure, standard or rule at one point in time may not be considered as such at some point in the future. Hence, due diligence in ensuring safety requires a State to keep abreast of technological changes and scientific developments."[74] The Seabed Disputes Chamber of the International Tribunal for the Law of the Sea also held, as a matter of general international law, that "due diligence is a variable concept", and that "It may change over time as measures considered sufficiently diligent at a certain moment may become not diligent enough in light, for instance, of new scientific or technological knowledge".[75]

5. Burden of proof and standard of proof

26. In the *Trail Smelter* case, the tribunal applied the *sic utere tuo* principle only under the condition when "the injury is established by clear and convincing evidence".[76] In general, there are two main standards of proof: the higher "beyond reasonable doubt" standard in a criminal case and the lower standard of proof of a

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[73] Ibid., p. 165, para. (2). Although the context is slightly different, the International Court of Justice stated in the *Pulp Mills* case that "the obligation ... to prevent pollution is an obligation to act with due diligence in respect of all activities which take place under the jurisdiction and control of each party. It is an obligation which entails not only the adoption of appropriate rules and measures, but also a certain level of vigilance in their enforcement and the exercise of administrative control applicable to public and private operators, such as the monitoring of activities under taken by such operators ..." *Pulp Mills on the River Uruguay, Judgment*, p. 79, para. 197.

[74] Ibid., p. 154, para. (11).

[75] International Tribunal for the Law of the Sea, Seabed Disputes Chamber, *Responsibilities and Obligations of States Sponsoring Persons and Entities with respect to Activities in the Area*, Advisory Opinion, ITLOS, Case No. 17, para. 117.

[76] *Trail Smelter* case (United States, Canada), 11 March 1941, *UNRIAA*, vol. III, p. 1965.

"balance of probabilities" in a civil case.[77] The tribunal in the *Trail Smelter* case appears to have set a higher standard of proof for transboundary air pollution,[78] and the special context and circumstances of that case should not be overlooked. First, both parties referred the case to the tribunal by special agreement. Therefore, the attitudes of both parties were relatively cooperative for the resolution of the dispute, and consequently they were able to entrust the International Joint Commission established pursuant to the Boundary Waters Treaty of 1909, with the scientific investigation.[79] Secondly, as a result of the scientific examination, it was considered that the direction of the wind that carried pollution across the boundary was unidirectional by reason of the geographical features and resulting meteorological conditions prevailing in the Columbia River valley.[80] Those factors enabled the tribunal to set a higher standard of proof in the case.

27. One can observe somewhat similar developments in the *Lac Lanoux* case.[81] The tribunal was established by *compromis* between the States. As for the fact-finding, the tribunal stated that "It has not been *clearly affirmed* that the proposed works [i.e. the diversion of the waters of the international river] would entail an abnormal risk in neighbourly relations or in the utilization of the waters" (emphasis added).[82] Therefore, the tribunal set a higher standard of proof. However, in that case, the river flow was unidirectional so that the chain of causation was relatively easy to establish as well.

28. By contrast, when one of the parties refers a dispute to an international court or tribunal on the basis of an optional clause, compromissory clause or treaty, or *forum prorogatum*, there tend to be different claims on the facts and allocation of the burden of proof. In that case, in accordance with the well-established principle of *onus probandi incumbit actori*, it is for the party alleging a fact to establish its existence.[83] However, it will be difficult for the (potentially) affected States to establish the alleged facts by clear and convincing evidence, because "the necessary information may largely be in the hands of the party causing or threatening the damage".[84] That is the main reason why a (potentially) affected State may claim a shift or reversal of the burden of proof based on the alleged precautionary principle. However, it may be noted that the International Court of Justice pointed out in the *Pulp Mills* case that the precautionary approach does not necessarily operate "as a reversal of the burden of proof".[85]

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[77] Anna Riddell and Brendan Plant, *Evidence before the International Court of Justice* (London, BIICL, 2009), p. 124; Eduardo Valencia-Ospina, "Evidence before the International Court of Justice", *International Law Forum du Droit international*, vol. 1 (1999), p. 203.

[78] Stephen C. McCaffrey, "Of paradoxes, precedents, and progeny: the *Trail Smelter* arbitration 65 years later", in Rebecca M. Bratspies and Russell A. Miller (eds.), *Transboundary Harm in International Law: Lessons from the Trail Smelter Arbitration* (New York, Cambridge University Press, 2006), p. 39.

[79] *Trail Smelter case*, p. 1918.

[80] Ibid., pp. 1943, 1969-1974. *See also*, John E. Read, "The *Trail Smelter* dispute [abridged]", in Bratspies and Miller (eds.), *Transboundary Harm in International Law* (New York: Cambridge University Press, 2006), p. 27.

[81] *Affaire du Lac Lanoux* (*Spain* v. *France*), 16 November 1957, *UNRIAA*, vol. XII, p. 281.

[82] Ibid.

[83] In the civil procedure of municipal courts, the result is the rule of *ei incumbit probatie qui dicit, non qui negat* (the burden of proof lies with who declares, not who denies).

[84] Dissenting Opinion of Judge Weeramantry, *I.C.J. Reports 1995*, p. 342.

[85] *Pulp Mills on the River Uruguay, Judgment, I.C.J. Reports 2010*, p. 71, para. 164.

29. In that case, the majority opinion preferred to resolve the burden-shifting problem by requiring the other party to cooperate "in the provision of such evidence as may be in its possession that could assist the Court in resolving the dispute submitted to it".[86] In the recent case of the *Application of the Genocide Convention (Croatia v. Serbia)*, although the applicant claimed that "the respondent is best placed ... to provide explanations of acts which are claimed to have taken place in a territory over which [the respondent] exercised exclusive control", the Court primarily allocated the burden of proof to the party alleging a fact, while it relied on the other party's "duty to co-operate" in good faith in matters of evidence.[87] However, the duty to cooperate in matters of evidence is a procedural duty, non-compliance with which does not give rise to State responsibility.[88]

30. In contrast, Judge Greenwood suggested, in his separate opinion in the *Pulp Mills* case, a lessening of the standard of proof in the circumstances of that case. Referring to the statement of the Court in the *Application of the Genocide Convention* case (*Bosnia and Herzegovina v. Serbia and Montenegro*) that charges of conduct as grave as genocide require "proof at a high level of certainty appropriate to the seriousness of the allegation",[89] he indicated that "in that statement ... a lower standard of proof is acceptable than in the case of other, less grave, allegations".[90] He concluded that "the nature of environmental disputes is such that the application of the higher standard of proof would have the effect of making it all but impossible for a State to discharge the burden of proof", and accordingly the (potentially) affected State is required to establish the facts on the balance of probabilities.[91]

31. Indeed, the International Court of Justice had already implied a "lessening of the standard of proof" in the 1949 *Corfu Channel* case,[92] stating:

> "It is true, as international practice shows, that a State on whose territory or in whose waters an act contrary to international law has occurred, may be called upon to give an explanation. ... But it cannot be concluded from the mere fact of the control exercised by a State over its territory and waters that that State

[86] Ibid., p. 71, para. 163.

[87] *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Croatia* v. *Serbia), Judgment*, paras. 170, 173.

[88] Durward V. Sandifer, *Evidence before International Tribunals* (Charlottesville: University Press of Virginia, 1975), pp. 112, 117; Mariko Fukasaka, "Burdens of proof before international litigation: burden of proof and producing evidence (1)", *Sophia Law Review*, vol. 52 No. 4 (2009), pp. 183-184 [in Japanese].

[89] *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina* v. *Serbia and Montenegro), Judgment, I.C.J. Reports 2007*, p. 130, para. 210. The standard of proof, i.e., what a party must do in order to discharge the burden of proof when that burden rests upon it, is essentially a common law tradition. In the civil law tradition, "if the judge considers himself to have been persuaded by the argument on a certain matter, then the standard of proof has been met". Whereas the International Court of Justice, being composed of the judges of "the principal legal systems of the world" (article 9 of the Statute), had long not referred to the standard of proof, in the case of the *Application of the Genocide Convention (Croatia* v. *Serbia)*, it addressed that concept for the first time.

[90] Separate Opinion of Judge Greenwood, *I.C.J. Reports 2007*, p. 230, para. 25.

[91] Ibid., p. 230, para. 26.

[92] Katherine Del Mar, "The International Court of Justice and Standards of Proof", in Bannelier, Christakis and Heathcote (eds.), *The International Court of Justice and the Evolution of International Law* (London: Routledge, 2013), pp. 98-123.

necessarily knew, or ought to have known, of any unlawful act perpetrated therein ... On the other hand, the fact of this exclusive territorial control exercised by a State within its frontiers has a bearing upon the methods of proof available to establish the knowledge of that State as to such events. By reason of this exclusive control, the other State, the victim of a breach of international law, is often unable to furnish direct proof of facts giving rise to responsibility. Such a State should be allowed a more liberal recourse to inferences of fact and circumstantial evidence. This indirect evidence is admitted in all systems of law, and its use is recognized by international decisions. It must be regarded as of special weight when it is based on a series of facts linked together and leading logically to a single conclusion."[93]

6. Jurisdiction and control

32. As stated in Max Huber's dictum in the *Island of Palmas* case, the dominant criterion for identifying the State that owes the obligation of protection is territorial jurisdiction.[94] Territory is a primary basis of jurisdiction. Consequently, when an activity occurs within the territory of a State, the duty to protect falls firstly on that State. The territoriality principle is not without exceptions,[95] and there may be a situation where extraterritorial application of a domestic law is envisaged in the context of transboundary atmospheric pollution.[96] On the other hand, in common

[93] *Corfu Channel Case, Judgment*, p. 18.

[94] "Perspectives from international economic law on transnational environmental issues", in Shinya Murase, *International Law: an Integrative Perspective on Transboundary Issues* (Tokyo, Sophia University Press, 2011), p. 92.

[95] Ibid., pp. 54-57, 295-304; American Law Institute, *Foreign Relations of the United States, Restatement Third* (Philadelphia/PA: ALI, 1987), section 402, pp. 230-234. F. A. Mann, "The doctrine of jurisdiction in international law", in *Studies in International Law*, Oxford: Oxford University Press, 1973, pp. 39-41; F. A. Mann, "The doctrine of international jurisdiction revisited after twenty years", *Further Studies in International Law* (Oxford: Clarendon Press, 1990), pp. 5-10; Werner Meng, "Extraterritorial effects of administrative, judicial and legislative acts", in Bernhardt, ed., *Encyclopedia of Public International Law*, vol. II, 1992, p. 340; Menno T. Kamminga, "Extraterritoriality", in Rüdiger Wolfrum, ed., *Encyclopedia of Public International Law*, vol. III, 2012, p. 1071.

[96] Section 4 of Singapore's Transboundary Haze Pollution Act 2014 (No. 24 of 2014) stipulates for extraterritorial application that "[t]his Act shall extend to and in relation to any conduct or thing outside Singapore which causes or contributes to any haze pollution in Singapore." It was explained by Singapore's Minister for the Environment and Water Resources (D. Vivian Balakrishanan) before Parliament that "[b]ecause we are addressing transboundary haze pollution, an extraterritorial approach is necessary for the law to be effective. This exercise of extraterritorial jurisdiction under the Bill is in line with international law, specially the objective territorial principle" (Parliament of Singapore, Official Reports, No. 12, Session 2, 4 August 2014). It may be noted, however, that the ASEAN Haze Convention is now effective (ASEAN Agreement on Transboundary Haze Pollution, entered into force on 25 November 2003, http://haze.asean.org/status-of-ratification/. To date, all the ASEAN member States are parties, since Indonesia, the last tenth ASEAN Member State, ratified the Agreement on 14 October 2014), it may not be necessary to resort to extraterritorial application of a domestic law, since the same objective can be achieved by application of the Convention, the method which is normally more desirable. However, if the measures contemplated under the Act extend beyond the scope of the Agreement, that part of the measures may be considered either as opposable or non-opposable in view of the legitimacy and effectiveness of the measures in question. See "Unilateral measures and the concept of opposability in international law", in Shinya Murase, *International Law: An Integrative Perspective on Transboundary Issues* (Tokyo: Sophia University Press, 2011), pp. 214-266.

areas, such as the high seas and the airspace above the high seas, there is no territorial link between a State and the activity because of the location of the activity. In such situations, if the activity leads to significant adverse effects on the atmosphere, the State exercising jurisdiction over the area in question should comply with the duty to prevent. An example is the introduction of substances or energy into the atmosphere by vessels or aircraft flying its flag in the area of other States or in areas beyond national jurisdiction, such as the high seas and the airspace above the high seas.

33. It may be noted that there has been a shift of emphasis from "jurisdiction" to "control" in exercising the State obligation of prevention. As both principle 21 of the 1972 Stockholm Declaration and principle 2 of the 1992 Rio Declaration use the disjunctive conjunction "or", the term "control" is distinct from the term "jurisdiction",[97] The two concepts have acquired a special meaning, to the effect that "activities within their ... control" are treated on a separate and independent basis.[98] In its previous work, the Commission considered that "[t]he function of the concept of 'control' in international law is to attach certain legal consequences to a State whose jurisdiction over certain activities or events is not recognized by international law; it covers situations in which a State is exercising de facto jurisdiction, even though it lacks jurisdiction de jure ..."[99] Therefore, jurisdiction refers to "legal" ties, whereas "control" refers to the factual capacity of effective control over activities outside the jurisdiction of a State. As for the concept of "control", the International Court of Justice stated in the *Namibia* case that "[t]he fact that South Africa no longer has any title to administer the Territory [of Namibia] does not release it from its obligations and responsibilities under international law towards other States in respect of the exercise of its powers in relation to this Territory. *Physical control of a territory, and not sovereignty or legitimacy of title, is the basis of State liability for acts affecting other States*" (emphasis added).[100]

34. In line with the jurisprudence of international courts and tribunals, the Special Rapporteur concludes that, in the context of transboundary atmospheric pollution, the principle *sic utere tuo ut alienum non laedas* has now been confirmed as a principle of general international law.[101]

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[97] However, there is a difference between the wording of the Stockholm Declaration, principle 21, and the observation of the advisory opinion in the *Nuclear Weapons Case*. While principle 21 provides for "activities within their jurisdiction or control", the International Court of Justice used the coordinate conjunction, stating "activities within their jurisdiction and control". One observer considers that "[i]t constrains the application of the principle by limiting extraterritorial application." Edith Brown Weiss, "Opening the door to the environment and to future generations", in Laurence Boisson de Chazournes and Philippe Sands, eds., *International Law, the International Court of Justice and Nuclear Weapons* (Cambridge: Cambridge University Press, 1999), p. 340.

[98] Louis B. Sohn, "The Stockholm Declaration on the Human Environment", *Harvard International Law Journal*, vol. 14 (1973), p. 493; Shinya Murase, *Kokusai Rippo* (International Lawmaking), Tokyo: Toshindo, 2002, pp. 421-422 (in Japanese), Chinese translation (Beijing: Chinese People's University of Public Safety Press, 2012), pp. 210-212.

[99] *Yearbook ... 2001*, vol. II, Part Two, p. 151, para. (12).

[100] *Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) Notwithstanding Security Council Resolution 276 (1970), Advisory Opinion, I.C.J. Reports 1971*, p. 54, para. 118.

[101] See A/CN.4/681, para. 58.

B. The duty to mitigate the risk of global atmospheric degradation

1. The *sic utere tuo* principle in the global context

35. As discussed above (para. 12), in the present draft guidelines, the *sic utere tuo* principle has two distinct dimensions, one in a transboundary context and the other in the global context. That differentiation should be viewed in line with the judgment in the *Pulp Mills* case by the International Court of Justice, which distinguished two different forms of obligations flowing from the principle.[102] One is the *sic utere tuo* principle in the narrow sense, as formulated in the *Trail Smelter* award, the other being the broader interpretation extending beyond the transboundary perspective. In one way, the Court in *Pulp Mills* limited the scope of application of the principle to damage to the environment of another State, stating that "A State is ... obliged to use all the means at its disposal in order to avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of *another State*" (emphasis added),[103] a formula which, according to the Court, is derived from the judgment in the *Corfu Channel* case.[104] In another way, the Court interpreted the *sic utere tuo* principle in the broader sense, affirming that the principle has since been expanded in scope to encompass a broader geographical context, by referring to the *Nuclear Weapons* advisory opinion that "the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of *areas beyond national control*" (emphasis added).[105]

36. In his second report, the Special Rapporteur stated that the *sic utere tuo ut alienum non laedas* principle, whose application was initially limited to the relationship with an "adjacent State" sharing a common territorial border, has subsequently been widened to include global atmospheric issues.[106] While the traditional principle dealt only with transboundary harm to other States in a narrow sense, it has evolved to extend the territorial scope so as to address the global commons per se.[107] In principle 21 of the Stockholm Declaration, the principle was reformulated, providing that "States have ... the responsibility [devoir] to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States *or of areas beyond the limits of national jurisdiction*." That part of the principle was reiterated in principle 2 of the Rio Declaration. The areas beyond the jurisdiction and sovereignty of any State, generally referred to as "global commons", are understood to include the high seas, outer space and the global atmosphere.[108] Although the atmosphere, which is not an area-based notion, does not conform to the notion of "areas beyond the limits of national jurisdiction",

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[102] Karine Bannelier, "Foundational Judgment or constructive myth? The Court's decision as a precursor to international environmental law", in Karine Bannelier, Theodore Christakis and Sarah Heathcote, eds., *The International Court of Justice and the Evolution of International Law: The Enduring Impact of the Corfu Channel Case* (New York: Routledge, 2012), p. 251.

[103] *I.C.J. Reports 2010*, p. 56, para. 101.

[104] Ibid., p. 55, para. 101. The Court affirmed in the Corfu Channel case "every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States". *I.C.J. Reports 1949*, p. 22.

[105] Ibid., p. 78, para. 193.

[106] See A/CN.4/681, paras. 52-57.

[107] Xue Hanqin, *Transboundary Damage in International Law* (Cambridge: Cambridge University Press, 2003), p. 191.

[108] Ibid., pp. 191-193; Alan E. Boyle, "State responsibility for breach of obligations to protect the global environment", in W. E. Butler, ed., *Control over Compliance with International Law* (Dordrecht: Nijhoff, 1991), p. 69.

it is nonetheless clear that the atmosphere existing above those areas is now covered by principle 21 of the Stockholm Declaration.[109]

37. It is notable that the *sic utere tuo* principle encounters certain evidentiary difficulties when it is applied to global issues, such as long-distance, transcontinental air pollution, ozone depletion and climate change. In such cases, the chain of causation, i.e. the physical link between cause (activity) and effect (harm), is difficult to prove, because of the widespread, long-term and cumulative character of their effects. The adverse effects, because of their complex and synergistic nature, result from multiple sources and any single activity is not sufficiently attributable to such adverse effects. In the global setting, virtually all States are likely to be responsible States as well as injured States. Consequently, even where actual harm has occurred, it is difficult, if not impossible, to identify a single responsible State of origin.[110] The difficulty of establishing the causal link between the wrongful act and the harm suffered has already been acknowledged by the Convention on Long-range Transboundary Air Pollution (1979). Article 1 of that convention characterizes long-range transboundary air pollution as pollution "at such a distance ... that it is not generally possible to distinguish the contribution of individual emission sources or groups of sources". Notwithstanding that definition, the Convention enshrines principle 21 of the Stockholm Declaration in the preambular paragraph as a "common conviction". The Vienna Convention for the Protection of the Ozone Layer and the United Nations Framework Convention on Climate Change recognize the above difficulties as well. However, they also expressly incorporate principle 21 of the Stockholm Declaration into their preambles and therefore can lead it to be considered an integral component of international law.[111]

38. In fact, it was confirmed in the International Court of Justice advisory opinion on *Nuclear Weapons* that the terms of principles 21 of the Stockholm Declaration and principle 2 of the Rio Declaration are "now part of the corpus of international law relating to the environment".[112] In the *Gabčikovo-Nagymaros Project* case, the Court reaffirmed this view, recognizing further that "it has recently had occasion to stress ...

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[109] Birnie, Boyle and Redgwell, *International Law and the Environment*, op. cit., p. 145, citing the preambles of the United Nations Framework Convention on Climate Change and other global conventions.

[110] In contrast, an "injured State" for the purpose of the law of state responsibility may be identified even in that case. According to article 42(b)(i) of the Articles on the responsibility of States for internationally wrongful acts, where the obligation breached is owed to the international community as a whole, a specially affected State is considered to be an injured State. According to the Commentary, "[e]ven in cases where the legal effects of an internationally wrongful act extend by implication ... to the international community as a whole, the wrongful act may have particular adverse effects on one State or on a small number of States". *Yearbook ... 2001*, vol. II, Part Two, article 43, para. (12). An example given in the Commentary is the pollution of the high seas, which constitutes a breach of the customary rule, where such pollution has a particular impact on the territorial sea of a particular State. In that case, "the breach exists in respect of all other States, but among these the coastal State which is particularly affected by the pollution is to be considered as 'specially' affected." Giorgio Gaja, "The concept of an injured State", in James Crawford, Alain Pellet and Simon Olleson, eds., *The Law of International Responsibility* (Oxford: Oxford University Press, 2010), p. 947. The same can be applied, for example, to acid rain damage resulting from transboundary air pollution or damage caused by the ozone hole.

[111] Yoshida Osamu, *The International Legal Régime for the Protection of the Stratospheric Ozone Layer* (The Hague: Kluwer Law International, 2001), pp. 62-67; Malgosia Fitzmaurice, "Responsibility and climate change", *German Yearbook of International Law*, vol. 53 (2010), pp. 117-118.

[112] *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996*, pp. 241-242, para. 29.

the great significance that it attaches to respect for the environment, not only for States *but also for the whole of mankind*" (emphasis added).[113] The Court also cited the same paragraph in the *Pulp Mills* case.[114] In addition, in the *Iron Rhine Railway* case, the tribunal stated that "Environmental law ... require[s] that where development may cause significant harm to the environment there is a duty to prevent, or at least mitigate, such harm ... This duty ... has now become a principle of general international law."[115] Those cases have confirmed the principle of not causing significant harm to the atmospheric environment of other States, not limited exclusively to adjacent States, as an established principle of customary international law.

2. Precaution

39. In the context of the protection of the atmosphere from global atmospheric degradation, substantive obligations incorporated in the relevant conventions are those of precautionary measures. Unlike the "preventive measures" that are based on scientific knowledge, precaution is addressed where there exists no sufficient scientific certainty. Thus, in dealing with the protection of the atmosphere, consideration of precaution is inevitable. Precaution is distinguished into two types: one is "precautionary measures" (precautionary approach) and the other the "precautionary principle". While the former implies administrative measures implementing the rules of precaution, the latter is a legal principle to be applicable before a court of law, the main function of which is to shift the burden of proof from the party alleging the existence of damage to the defendant party, who is required to prove non-existence of the damage.[116] While there are a few conventions providing for a precautionary principle,[117] international courts and tribunals have thus far

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[113] *Gabčikovo-Nagymaros Project (Hungary vs. Slovakia), Judgment, I.C.J. Reports 1997*, p. 41, para. 53.

[114] *Pulp Mills on the River Uruguay, Judgment*, p. 78, para. 193.

[115] Award in the Arbitration regarding the *Iron Rhine* ("Ijzeren Rijn") Railway between the Kingdom of Belgium and the Kingdom of the Netherlands, decision of 24 May 2005, *UNRIAA*, vol. XXVII, pp. 66-67, para. 59. It may have been premature to say that Principle 21 was only a starting point and that the principle had not yet entered into customary international law at the time of the adoption of the Stockholm Declaration in 1972. However, subsequent developments of jurisprudence, such as the 1995 *Nuclear Tests II* case, the 1996 *Nuclear Weapons* case, the 1997 *Gabčikovo-Nagymaros Project* case and the 2010 *Pulp Mills* case, confirm the customary status of the principle, consolidated by State practice and *opinio juris* as well; see Birnie, Boyle and Redgwell, *International Law and the Environment*, op. cit., p. 143; Paolo Galizzi, "Air, Atmosphere and Climate Change", in Shawkat Alam, et al., eds., *Routledge Handbook of International Environmental Law* (London: Routledge, 2014), pp. 333-347.

[116] In adopting the 2000 Cartagena Protocol on Biosafety, States opted for "precautionary approach" rather than "precautionary principle" as reflected in its preamble (Nicolas de Sadeleer, "The principle of prevention and precaution in international law: two heads of the same coin?" in Malgosia Fitzmaurice, et al., eds., *Research Handbook*, op. cit., pp. 191-192). On this continuing discourse, see Jonathan B. Wiener, "The rhetoric of precaution", in Jonathan B. Wiener et al., eds., *The Reality of Precaution: Comparing Risk Regulation in the United States and Europe* (Washington/DC and London: Earthscan, 2011), pp. 3-35.

[117] For example, 1996 Protocol to the London Dumping Convention and the 2001 Stockholm POPs Convention. Sadeleer, op. cit., pp. 186-187. Arie Trouwborst, *Evolution and Status of the Precautionary Principle in International Law* (The Hague: Kluwer Law International, 2002), p. 15; Jonathan B. Wiener, "Precaution", in Daniel Bodansky et al., eds., *Oxford Handbook*, op. cit., p. 601. See Antonio A. Cançado Trindade, "Principle 15: precaution", in Duvic-Paoli and Vinuales, *The Rio Declaration on Environment and Development*, op, cit., pp. 417-421.

never recognized the precautionary principle as customary international law, although it has been invoked several times by claimants.[118] It should thus be considered inappropriate to refer to a precautionary principle in the present guidelines.[119] As mentioned above, the law relating to degradation of the atmosphere is based on the idea of precaution and the relevant conventions incorporate the precautionary approaches/measures, either explicitly or implicitly, as essential elements for the obligation of States to minimize the risk of atmospheric degradation.

40. On the basis of the foregoing, the following draft guideline is proposed:

Draft guideline 3: Obligation of States to protect the atmosphere

States have the obligation to protect the atmosphere from transboundary atmospheric pollution and global atmospheric degradation.

(a) Appropriate measures of due diligence shall be taken to prevent atmospheric pollution under international law.

(b) Appropriate measures shall be taken to minimize the risk of atmospheric degradation in accordance with relevant conventions.

C. The duty to assess environmental impacts

41. One of the important obligations of States in protecting the atmosphere by preventing atmospheric pollution and minimizing the risk of atmospheric degradation is to conduct an appropriate environmental impact assessment. In the recent case of the International Court of Justice on the *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, the Court affirmed that "a State's obligation to exercise due diligence in preventing significant transboundary harm requires that State to ascertain whether there is a risk of significant transboundary harm prior to undertaking an activity having the potential adversely to affect the environment of another State. If that is the case, the State concerned must conduct an environmental impact assessment",[120] and concluded that the State in question had "not complied with its obligation under general

[118] The ITLOS order on the provisional measures of 27 August 1999 in the cases of *Southern Blue Fin Tuna (New Zeeland* v. *Japan; Australia* v. *Japan)* held that the parties should "act with *prudence and caution* to ensure that effective conservation measures are taken to prevent serious harm to the stock of southern blue fin tuna" (emphasis added), but the Tribunal avoided referring to the "precautionary principle" that had been invoked by the applicants. (para. 77 of the Order. This Order was nullified by the subsequent award by the Arbitral Tribunal of 4 August 2000.) In the *Mox Plant (Ireland* v. *United Kingdom)* case, the Tribunal again referred to "prudence and caution" rather than the "precautionary principle" (Order of 3 December 2001, para. 84). The phrase was repeated by the Tribunal in the *Case concerning Land Reclamation by Singapore in and around the Strait of Johor (Malaysia* v. *Singapore)* (Order of 8 October 2003, para. 99). See Sadeleer, op. cit., pp. 189, 208.

[119] In elaborating the 2013 understanding, this difference was stressed by the Special Rapporteur and it was agreed that "precautionary approach/measures" could be dealt with in the draft guidelines, if not the "precautionary principle" (noting however the phrase "but without prejudice to" in the said understanding). The present guidelines proposed by the Special Rapporteur do not refer to either of the two concepts. The concept of precautionary approach/ measures is naturally implicit in draft guideline 3 (a) below.

[120] *Construction of a Road in Costa Rica along the San Juan River, Judgment*, para. 153.

international law to perform an environmental impact assessment prior to the construction of the road".[121] It may be noted that "an environmental impact assessment plays an important and even crucial role in ensuring that the State in question is acting with due diligence under general international environmental law".[122]

1. Evolution of environmental impact assessment in international law

42. Environmental impact assessment, a process which identifies and analyses the environmental impact of a certain project, plan or programme,[123] was first introduced in the 1969 National Environmental Policy Act of the United States of America. Today, more than 130 States around the world have followed or adapted the model of environmental impact assessment in their national legislation.[124] At the international level, environmental impact assessment is said to have emerged after the United Nations Conference on the Human Environment, held in Stockholm in 1972. Even though the Stockholm Declaration did not expressly refer to environmental impact assessment, its principles 14 and 15 have been interpreted as implying the rationale underlying environmental impact assessment.[125] Furthermore, Principle 17

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[121] Ibid., para. 168.

[122] Judge Hisashi Owada's separate opinion, para. 18.

[123] Astrid Epiney, "Environmental impact assessment", in *Encyclopedia of Public International Law*, vol. III (Oxford: Oxford University Press, 2012), pp. 580-592; Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (Cambridge: Cambridge University Press), 3rd ed., 2012, pp. 601-623; Olufemi Elias, "Environmental impact assessment", in Malgosia Fitzmaurice et al., eds. *Research Handbook on International Environmental Law*, op. cit., pp. 227-242; John Glasson, Riki Therivel and Andrew Chadwick, *Introduction To Environmental Impact Assessment* (Oxford: Routledge, 2013); David B. Hunter, "International environmental law: sources, principles and innovations" in Paul G. Harris, *Routledge Handbook of Global Environmental Politics* (Oxford: Routledge, 2013); Donald K. Anton, "Case concerning pulp mills on the River Uruguay (*Argentina v Uruguay*) (Judgment) [2010] I.C.J. Reports (10 April 2010)", available from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1705810; Deng Hua, "The evolution and implementation of environmental impact assessment in international law", *Sun Yat-Sen University Law Review*, vol. 13, No. 3 (2015), pp.129-148 (in Chinese). See also Nicholas A. Robinson, "International trends in environmental assessment", *Boston College Environmental Affairs Law Review*, vol. 19 (1992), pp. 591-622; Kevin R. Gray, "international environmental impact assessment-potential for a multilateral environmental agreement", *Colorado Journal of International Environmental Law and Policy*, vol.11 (2000), pp. 83-128; John H. Knox, "The myth and reality of transboundary environmental impact assessment", *AJIL*, vol.96 (2002), pp. 291-319; John H. Knox, "Assessing the candidates for a global treaty on transboundary environmental impact assessment", *New York University Environmental Law Journal*, vol.12 (2003), pp. 153-168; Charles M. Kersten, "Rethinking transboundary environmental impact assessment", *Yale Journal of International Law*, vol. 34 (2009), pp.173-206; Vanessa Edwards, "Review of the Court of Justice's case law in relation to waste and environmental impact assessment", *Journal of Environmental Law*, vol. 25 (2013), pp. 515-530; Mary Sabina Peters, "Minimize risk of carbon sequestration through environmental impact assessment and strategic environmental assessment", *European Energy and Environmental Law Review*, vol. 24 (2015), pp. 12-16.

[124] Kersten, ibid., p.176; James Rasband et al., *Natural Resources Law and Policy* (New York: Foundation Press, 2nd ed., 2009), p. 253.

[125] Principles 14 and 15 of the Stockholm Declaration provide as follows. Principle 14: "Rational planning constitutes an essential tool for reconciling any conflict between the needs of development and the need to protect and improve the environment." Principle 15: "Planning must be applied to human settlements and urbanization with a view to avoiding adverse effects on the environment and obtaining maximum social, economic and environmental benefits for all. In this respect projects which are designed for colonialist and racist domination must be abandoned." A/CONF.48/14/Rev.1.

of the 1992 Rio Declaration provides in a mandatory form (although the Declaration itself is a non-binding instrument): "Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to decision of a competent national authority."[126]

43. Today, environmental impact assessment has been widely adopted in international legal systems and included in numerous international conventions.[127] It is defined as "a national procedure for evaluating the likely impact of a proposed activity on the environment" (Convention on Environmental Impact Assessment in a Transboundary Context, Espoo Convention, article 1 (vi)).[128] A number of international judicial precedents have confirmed the requirements of environmental impact assessment.[129] Generally, it is used as a legal technique for rendering possible integration of environmental considerations into the decision-making process, proposing possible measures to mitigate adverse environmental effects and describing alternatives that are less harmful to the environment, helping the decision maker to evaluate a project and then make a decision as to whether to implement the project or not, and enabling possible affected persons to participate in the decision-making process, etc.[130] Furthermore, it is regarded as necessary to understand the environmental impacts of a project as early as possible, in order to prevent, reduce or control environmental harm.[131] Moreover, in the context of the principle of sustainable development, it is also a legal technique for reconciling socioeconomic development and environmental protection, with a view to striking a proper balance for sustainable development.[132] Environmental impact assessment itself is a procedure and neither compels by itself a particular result, nor mposes substantive environmental standards.[133]

2. Treaties

44. There is so far no comprehensive global convention governing transboundary environmental impact assessment; instead, States have addressed the subject mainly through a series of regional or sectoral treaties. As a result, environmental impact assessment regimes vary from region to region and from resource to resource.[134] A large number of conventions include provisions requiring an environmental impact assessment, of which the field of marine environmental protection is of special importance for the development of the process.[135] The following conventions refer

[126] Rio Declaration on Environment and Development, A/CONF.151/26/Rev.1, vol. I.

[127] See paras. 44-50 below.

[128] Convention on Environmental Impact Assessment in a Transboundary Context, 25 February 1991, United Nations Treaties Series, vol. 1989, p. 310 (entered into force 10 September 1997) (hereinafter Espoo Convention).

[129] See paras. 52-58 below.

[130] Epiney, "Environmental impact assessment", p. 581.

[131] Ibid., p. 580.

[132] Gerry Bates, *Environmental Law in Australia*, 7th ed. (Chastwood, N.S.W: Lexis Nexis Butterworths, 2010), p. 307.

[133] Elias, "Environmental Impact Assessment", op. cit., p. 227.

[134] For a discussion as to why a global treaty on environmental impact assessment remains elusive, see Knox, "Assessing the candidates for a global treaty on transboundary environmental impact assessment", op. cit., pp. 153-168; see also Kersten, "Rethinking transboundary environmental impact assessment", op. cit., p. 178.

[135] Epiney, "Environmental impact assessment", op. cit., p. 582.

in different ways to the obligation to conduct an environmental impact assessment: (a) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972 and its 1996 Protocol) (articles 4 and 5, annexes II and III);[136] (b) United Nations Convention on the Law of the Sea 1982 (article 206);[137] (c) Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution 1978 (article 11);[138] (d) Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region 1981 (article 13);[139] (e) Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific 1981 (article 8);[140] (f) Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment 1982 (article 11);[141] (g) Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region 1983 (article 12);[142] (h) Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean 1985/2010 (article 14);[143] (i) Convention for the Protection of the Natural Resources and Environment of the South Pacific Region 1986 (Noumea Convention) (article 16);[144] (j) Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean 1976/1995 (article 4);[145] and its Protocols for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (1994, article 5) and on Integrated Coastal Zone Management in the Mediterranean (2008, article 19); (k) Framework Convention for the Protection of the Marine Environment of the Caspian Sea 2003 (article 17)[146] and its Protocol on Pollution from Land-based Sources and Activities (2012, article 12; a further protocol on environmental impact assessment in a transboundary context is scheduled to be adopted in 2016).

45. Conventions in other fields of international environmental law also provide for an environmental impact assessment: (a) Convention on the Protection of the Environment between Denmark, Finland, Norway, and Sweden 1974 (article 6);[147] (b) Association of Southeast Asian Nations (ASEAN) Agreement on the Conservation of Nature and Natural Resources 1985 (article 14 (1));[148] (c) Canada-USA Agreement on Air Quality 1991 (article 5)[149]; (d) United Nations Framework

[136] *United Nations Treaty Series*, vol. 1046, p. 138.
[137] *United Nations Treaty Series*, vol. 1833, p. 396.
[138] *United Nations Treaty Series*, vol. 1140, p. 155.
[139] Available from http://abidjanconvention.org/media/documents/publications/Abidjan%20Convention%20English.pdf.
[140] Available at: http://sedac.ciesin.org/entri/texts/marine.environment.coastal.south.east.pacific.1981.html.
[141] *Environmental Policy and Law*, vol. 9, p. 56, available at http://sedac.ciesin.org/entri/texts/red.sea.gulf.of.aden.1982.html.
[142] *United Nations Treaty Series*, vol. 1506, p. 157.
[143] Available at http://www.unep.org/NairobiConvention/docs/Final_Act_Nairobi_Amended_Convention&Text_Amended_Nairobi_Convention.pdf.
[144] Available at http://sedac.ciesin.org/entri/texts/natural.resources.south.pacific.1986.html.
[145] *United Nations Treaty Series*, vol. 1102, p. 27.
[146] Available at: http://www.tehranconvention.org/IMG/pdf/Tehran_Convention_text_final_pdf.pdf.
[147] Available at http://sedac.ciesin.org/entri/texts/acrc/Nordic.txt.html.
[148] Available at http://environment.asean.org/agreement-on-the-conservation-of-nature-and-natural-resources/.
[149] Available at www.ijc.org/rel/agree/air.html.

Convention on Climate Change 1992 (article 4 (1) (f));[150] (e) Convention on Biological Diversity 1992 (article 14 (1));[151] (f) Protocol on Environmental Protection to the Antarctic Treaty 1991 (article 8);[152] (g) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 1989 (article 4 (2) (f));[153] (h) Convention on the Protection and Use of Transboundary Watercourses and International Lakes 1992 (articles 3 (1) (h) and 9 (2) (j)).[154]

46. It is noteworthy that several multilateral financial institutions insist that the borrower States conduct an environmental impact assessment as a condition of their lending activities. The pertinent instruments of the International Bank for Reconstruction and Development (World Bank) provide for its own assessment procedures, which are laid down in the World Bank environmental assessment operational policy 4.01 (January 1999, revised in April 2013, currently under further review), according to which the World Bank requires an environmental impact assessment of projects proposed for financing. In the course of the assessment, an array of factors are to be taken into consideration, including the natural environment, human health and safety, social aspects and transboundary and global environmental implications, and public participation has to be guaranteed. The World Bank is free to refuse financing of a project that may have harmful consequences for the environment. The purpose of imposing this obligation is to help ensure that the projects are environmentally sound and sustainable with a view to improving its decision-making.[155] It may be noted that the newly established Asian Infrastructure Investment Bank has also proposed certain environmental assessment provisions.[156]

47. The leading multilateral instrument in the field of environmental impact assessment is the Espoo Convention,[157] which is particularly important in the development of the environmental impact assessment regime in international law. The Convention sets out the obligations of parties to assess the environmental impact of certain activities at an early stage of planning and it also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.[158] Since it was adopted under the auspices of the Economic Commission

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[150] *United Nations Treaty Series*, vol. 1771, p. 107.

[151] Ibid., vol. 1760, p. 79.

[152] *International Legal Materials*, vol. 30, p. 1455 (1991), and available at http://www.polarlaw.org/1991protocol.htm.

[153] *United Nations Treaty Series*, vol. 1673, p. 57.

[154] Ibid., vol. 1936, p. 269.

[155] Epiney, "Environmental impact assessment", op. cit., pp. 582-583; see also Philippe Sands, *Principles of International Environmental Law*, 2nd ed. (Manchester: Manchester University Press, 2003), pp. 821-822. For similar environmental assessment guidelines adopted by the African Development Bank, the Asian Development Bank and the Inter-American Development Bank, see Günther Handl, *Multilateral Development Banking: Environmental Principles and Concepts Reflecting General International Law and Public Policy* (London: Kluwer Law International, 2001). See also the International Seabed Authority, "Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area", ISBA/19/LTC/8.

[156] See www.aiib.org/uploadfile/2015/0907/20150907061253489.pdf.

[157] Convention on Environmental Impact Assessment in a Transboundary Context, Feb 25, 1991, *United Nations Treaties Series*, vol. 1989, p. 310 (entered into force 10 September 1997) (Espoo Convention).

[158] See http://www.unece.org/env/eia/eia.html.

for Europe (ECE), the geographical scope of the Espoo Convention was at first limited to the ECE region (45 parties, including the European Union). However, following the entry into force of its first amendment on 26 August 2014, the Convention is now open to all States Members of the United Nations, which it is expected will play an important role in international law, further advancing environmental impact assessment as an important tool for sustainable development.[159]

48. According to its article 2 (1), the general purpose of the Espoo Convention is the commitment of parties to take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities. Therefore, according to article 2 (2), the parties are required to establish an environmental impact assessment procedure for certain activities within their jurisdiction that are likely to have a "significant adverse transboundary impact"; moreover, the parties have the obligation to notify and consult with potentially affected States regarding the expected transboundary effects of the activity. According to article 1 on definitions, "proposed activities" means any activity or any major change to an activity subject to a decision of a competent authority in accordance with an applicable national procedure; "environmental impact assessment" means a national procedure for evaluating the likely impact of a proposed activity on the environment; "impact" means any effect caused by a proposed activity on the environment including human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factors, and also includes effects on cultural heritage or socioeconomic conditions resulting from alterations to those factors; "transboundary impact" means any impact, not exclusively of a global nature, within an area under the jurisdiction of a Party caused by a proposed activity the physical origin of which is situated wholly or in part within the area under the jurisdiction of another Party.[160] More detailed procedural obligations are laid down in the other provisions of the Convention. The significance of the Convention lies in the fact that it provides for rather detailed and precise standards as regards the manner of carrying out an environmental impact assessment.[161] The Espoo Convention has been applied with significant frequency, which reflects the increase in the number of parties, but also indicates that States consider transboundary environmental impact assessment as a valuable procedure for informing and consulting the authorities and the public of neighbouring countries. In 2003, the Convention was supplemented by the Protocol on Strategic Environmental Assessment (entered into force in 2011). The Protocol lays the groundwork for sustainable development: it ensures that parties integrate environmental, including health, considerations and public concerns into their plans and programmes and, to the extent possible, also into policies and legislation, at the earliest stages. As of January 2016, there were 26 parties to the Protocol, including the European Union.[162]

[159] UNECE press releases, "UNECE Espoo Convention on Environmental Impact Assessment Becomes a Global Instrument" (27 August 2014), available at http://www.unece.org/info/media/presscurrent-press-h/environment/2014/unece-espoo-convention-on-environmental-impact-assessment-becomes-a-global-instrument/unece-espoo-convention-on-environmental-impact-assessment-becomes-a-global-instrument.html.

[160] See article 1 of the Convention (Definitions) http://www.unece.org/fileadmin/DAM/env/eia/documents/legaltexts/Espoo_Convention_authentic_ENG.pdf.

[161] Epiney, "Environmental impact assessment", op cit., p.584.

[162] https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4-b&chapter=27&lang=en.

49. Transboundary environmental impact assessment has also been adopted by the European Union, which has issued directives that require a member State to assess the impact of a project on the environment of other member States. The original environmental impact assessment directive (85/337/EEC) has been in force since 1985 and applies to a wide range of public and private projects, as defined in annexes I and II.[163] The directive has been amended three times, in 1997, 2003 and 2009 respectively. Directive 97/11/EC brought its content into line with the Espoo Convention, widening its scope of regulation by increasing the types of projects covered and the number of projects requiring mandatory environmental impact assessment (at annex I). It also provided for new screening arrangements, including new screening criteria (at annex III) for annex II projects and established minimum information requirements. Directive 2003/35/EC was aimed at aligning the provisions on public participation with the 1998 Convention on Public Participation in Decision-making and Access to Justice in Environmental Matters. Directive 2009/31/EC amended annexes I and II of directive 85/337/EEC by adding projects related to the transport, capture and storage of carbon dioxide. Directive 85/337/EEC and its three amendments were codified by directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU was amended in 2014 by directive 2014/52/EU, which entered into force on 15 May 2014 to simplify the rules for assessing the potential effects of projects on the environment.[164] It is in line with the drive for smarter regulation in order to reduce administrative burdens. It also improves the level of environmental protection, with a view to making business decisions on public and private investments more sound, predictable and sustainable in the longer term. The new approach pays greater attention to threats and challenges that have emerged since the original rules came into force over 30 years ago. That means that more attention is paid to areas such as resource efficiency, climate change and disaster prevention, which are now better reflected in the assessment process.[165] In comparison with a large number of international instruments, the environmental impact assessment directive contains rather detailed provisions that have also been specified by many rulings of the European Court of

[163] Kersten, "Rethinking trans-boundary environmental impact assessment", op. cit., p. 180.

[164] See http://ec.europa.eu/environment/eia/eia-legalcontext.htm.

[165] The main amendments of EIA Directive 2014/52/EU are as follows: (1) Member States now have a mandate to simplify their different environmental assessment procedures. (2) Time frames are introduced for the different stages of environmental assessments: screening decisions should be taken within 90 days (although extensions are possible) and public consultations should last at least 30 days. Member States also need to ensure that final decisions are taken within a "reasonable period of time". (3) The screening procedure, determining whether an EIA is required, is simplified. Decisions must be duly motivated in the light of the updated screening criteria. (4) EIA reports are to be made more understandable for the public, especially as regards assessments of the current state of the environment and alternatives to the proposal in question. (5) The quality and the content of the reports will be improved. Competent authorities will also need to prove their objectivity to avoid conflicts of interest. (6) The grounds for development consent decisions must be clear and more transparent for the public. Member States may also set time frames for the validity of any reasoned conclusions or opinions issued as part of the EIA procedure. (7) If projects do entail significant adverse effects on the environment, developers will be obliged to do the necessary to avoid, prevent or reduce such effects. These projects will need to be monitored using procedures determined by the member States. Existing monitoring arrangements may be used to avoid duplication of monitoring and unnecessary costs. See for details: http://ec.europa.eu/environment/eia/review.htm.

Justice.[166] The Court has thus contributed in a decisive way to the effectiveness of the directive, while its formulations still leave notable discretion to member States.[167]

50. The 1991 Protocol on Environmental Protection to the Antarctic Treaty incorporates a more progressive form of environmental impact assessment. Article 8 (1) provides that proposed activities shall be subject to the procedures set out in annex I to the Protocol for prior assessment of the impacts of those activities on the Antarctic environment. If a proposed activity is found to cause "less than a minor or transitory impact", that activity may proceed. If it is not so found, an initial environmental evaluation will be prepared, and if it is found that there is "minor or transitory impact", the activity may proceed under appropriate procedures of monitoring, assessment and verification of the impact of the activity. If it is found that there is "more than a minor or transitory impact", a comprehensive evaluation will be circulated to all parties and made publicly available, and considered by the Consultative Meeting. That represents an advanced version of how the requirement for an environmental impact assessment operates and is more likely to be acceptable within defined contexts such as Antarctica.[168]

3. Non-binding instruments

51. With regard to non-binding instruments on the subject of environmental impact assessment, the following instruments are noteworthy: (a) United Nations Environment Programme (UNEP), draft principles of conduct in the field of the environment for the guidance of states in the conservation and harmonious utilization of natural resources shared by two or more States (principle 5),[169] endorsed by the General Assembly in resolution 34/186; (b) UNEP, conclusions of the study of legal aspects concerning the environment related to offshore mining and drilling within the limits of national jurisdiction (UNEP/GC.9/5/Add.5, annex III),[170] endorsed by the General Assembly in resolution 37/217; (c) World Charter for Nature (paras. 11 (b) and (c)) endorsed by the General Assembly in resolution 37/7 (1982);[171] (d) UNEP, Goals and Principles of Environmental Impact Assessment of 1987 (UNEP/GC.14/17, annex III) endorsed by the General Assembly in resolution 42/184;[172] (e) United Nations Conference on Environment and Development, Rio Declaration on Environment and Development (principle 17) (1992);[173] and finally, (f) the draft articles on prevention of transboundary harm from hazardous activities

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[166] For example: Case C-301/95 *Commission of the European Communities* v. *Federal Republic of Germany* (1998) ECR I-6135; Case C-392/96 *Commission of the European Communities* v. *Ireland* (1999) ECR I-5901; Case C-87/02 *Commission* v. *Italy* (2004) ECR I-5975; Case C-508/03 *Commission of the European Communities* v. *United Kingdom of Great Britain and Northern Ireland* (2006) ECR I-3969; Case C-290/03 *Barker* v. *London Borough of Bromley* (2006) ECR I-3949; Case C-435/97 *World Wildlife Fund* v. *Autonome Provinz Bozen* (1999) ECR I-5613; Case C-287/98 *State of the Grand Duchy of Luxembourg* v. *Linster* (2000) ECR I-6917; etc.

[167] Epiney, "Environmental impact assessment", op. cit., p. 586.

[168] Elias, "Environmental impact assessment", op. cit., p. 234.

[169] UNEP/GC.6/17.

[170] UNEP/GC.9/5/Add.5, annex III.

[171] *Official Records of the General Assembly, Thirty-seventh Session, Supplement No. 51* (A/37/51), p. 17, UN Doc. A/Res/37/7 (1982).

[172] UNEP/GC.14/17, annex III, endorsed by A/Res/42/184.

[173] See para. 14, supra above, footnote 42.

of 2001.[174] It should be noted that draft article 7 provides as follows: "Any decision in respect of the authorization of an activity within the scope of the present articles shall, in particular, be based on an assessment of the possible transboundary harm caused by that activity, including any environmental impact assessment." According to its commentary, draft article 7 does not oblige the State of origin to require risk assessment for any activity being undertaken within its territory or otherwise under its jurisdiction or control. However, draft article 7 is fully consonant with principle 17 of the Rio Declaration, which provides also for assessment of the risk of activities that are likely to have a significant adverse impact on the environment. A State of origin should thus ensure that an assessment is undertaken of the risk of the activity causing significant transboundary harm and that the assessment enables the State to determine the extent and the nature of the risk involved in an activity and consequently the type of preventive measures it should take. Although draft article 7 does not specify what the content of the risk assessment should be, such an assessment should contain an evaluation of the possible transboundary harmful impact of the activity and include the effects of the activity not only on persons and property, but also on the environment of other States.[175]

4. Judicial decisions

52. It may be appropriate here to review briefly how international courts and tribunals have regarded the obligation of carrying out an environmental impact assessment in their jurisprudence. In the second *Nuclear Tests* case before the International Court of Justice in 1995,[176] New Zealand sought to prevent France resuming underground nuclear testing in the Pacific, citing among other reasons that France had not conducted an environmental impact assessment, as required under the Noumea Convention, 1986,[177] and also under customary international law.[178] It may be noted that France does not seem to have denied the existence of those obligations under the Noumea Convention and under customary international law. Instead, its argument was that an environmental impact assessment should be understood as leaving some latitude to States in conducting the assessment. While the majority of the members of the Court did not consider those points for lack of jurisdiction, Judge Weeramantry stated that in his opinion the obligation to carry out the transboundary environmental impact assessment had become sufficiently developed for the Court to "take notice" of it,[179] and Judge ad hoc Sir Geoffrey Palmer also considered that customary international law might require such an assessment in respect of activities that could have significant environmental effects.[180]

53. In the 1997 *Gabčikovo-Nagymaros Project* case, the concept of environmental impact assessment was first referred to by Hungary, claiming that "a joint

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[174] See *Yearbook ... 2001*, vol. II, Part Two, para. 97.

[175] Ibid., para. 98.

[176] *Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court's Judgement of 20 December 1974 in the Nuclear Tests, I.C.J. Reports 1995*, pp. 288f.

[177] Convention for the Protection of Natural Resources and Environment of the South Pacific Region, 24 November 1986 (entered into force 22 August 1990, see para. 44 supra) available at: http://sedac.ciesin.org/entri/texts/natural.resources.south.pacific.1986.html.

[178] New Zealand's pleadings, 1995: CR/95/20, paras. 10-25.

[179] Dissenting Opinion of Judge Weeramantry, *Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court's Judgement of 20 December 1974 in the Nuclear Tests, I.C.J Reports 1995*, p. 344.

[180] Ibid., p. 412; See Elias, "Environmental impact assessment", op. cit., pp. 234-235.

environmental impact assessment of the region and of the future of Variant C structures in the context of the sustainable development of the region should be carried out".[181] In its judgment, the International Court of Justice seems to admit that there is an obligation to proceed to an environmental impact assessment before realizing a project with potentially harmful effects on the environment of another State, the Court doing so by interpreting the relevant treaty in an evolving way[182] and holding that: "It is clear that the Project's impact upon, and its implications for, the environment are of necessity a key issue. The numerous scientific reports which have been presented to the Court by the Parties ... provide abundant evidence that this impact and these implications are considerable. In order to evaluate the environmental risks, current standards must be taken into consideration. This is not only allowed by the wording of articles 15 and 19 of the Treaty on the Construction and Operation of the Gabčikovo-Nagymaros Barrage System signed in Budapest on 16 September 1977, but even prescribed, to the extent that these articles impose a continuing — and thus necessarily evolving — obligation on the parties to maintain the quality of the water of the Danube and to protect nature. The Court is mindful that, in the field of environmental protection, vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage."[183] The Court stressed that newly developed environmental standards had to be taken into account "not only when States contemplate new activities but also when continuing with activities begun in the past",[184] thus noting the close relationship between prior impact assessment and subsequent monitoring of the implementation of treaties to take account of environmental effects.[185]

54. The 2005 award of the *Iron Rhine* arbitration provided support as to the general requirement of an environmental impact assessment under international law. The tribunal stated that both international law and European Community law require "the integration of appropriate environmental measures in the design and implementation of economic development activities" and that "emerging principles now integrate environmental protection into the development process", thus endorsing the views expressed by the International Court of Justice in the *Gabčikovo-Nagymaros Project* judgment.[186]

55. In the 2010 *Pulp Mills* case judgment, the International Court of Justice noted the practice of environmental impact assessment, "which in recent years has gained so much acceptance among States that *it may now be considered a requirement under general international law to undertake an environmental impact assessment* where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource" (emphasis added).[187] Although the 1975 Statute of the River Uruguay between

[181] *Gabcikovo-Nagymaros Project, Judgment*, p. 73, para. 125.
[182] Epiney, "Environmental impact assessment", op. cit., p. 588.
[183] *Gabcikovo-Nagymaros Project, Judgment*, pp. 77-78, para. 140.
[184] Ibid., Judge Wearamantry referred in his opinion to the "principle of continuing environmental impact assessment", stating that the incorporation of environmental considerations into the treaty meant that EIA with a duty of monitoring was also built into the treaty. Ibid., pp. 111-112.
[185] Elias, "Environmental impact assessment", op. cit., p. 235.
[186] UNRIAA, vol. XXVII, para. 59.
[187] In the *Pulp Mills* case, the Court held that "an environmental impact assessment must be conducted prior to the implementation of a project". *Pulp Mills on the River Uruguay*, Judgment, p. 83, para. 204.

Argentina and Uruguay did not require an environmental impact assessment, Uruguay had prepared one. While both parties agreed that international law required such an assessment, Argentina argued that the scope of the Uruguayan assessment did not satisfy international standards, particularly with regard to the evaluation of siting alternatives and public consultation. The Court found that the assessment was adequate in both respects.[188] One of the most significant outcomes of the *Pulp Mills* case is the recognition by the Court that environmental impact assessment is a practice that has become an obligation of general international law in situations where a proposed industrial activity may have a significant adverse impact on another State or a shared natural resource. The comments of the Court should be seen as reflecting standard practice in defining some of the issues that States should consider when implementing the obligation to carry out an assessment through their own domestic legislation or project authorization procedures. For example, the indication by the Court that an environmental impact assessment must be conducted "prior to the implementation of a project"[189] would seem to imply that such an assessment can influence the decision and the overall design of a project.[190] The statement by the Court that an environmental impact assessment must be followed, when necessary, by continuous monitoring of the effects of the project on the environment throughout the life of the project is reflective of best practice and logically flows from the acknowledgement by the Court of "due diligence, and the duty of vigilance and prevention which it implies".[191] Thus, while in the *Gabčikovo-Nagymaros Project* case the Court stopped short of recognizing the non-conventional status of the requirement of an environmental impact assessment, it seems that the Court positively endorsed such a status in the *Pulp Mills* case. It may be concluded that environmental impact assessment is now recognized as an essential tool for integrating environmental concerns into the development process and therefore that a general requirement of environmental impact assessment is now part of positive international law.[192]

56. In 2011, the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea rendered its Advisory Opinion on the responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area.[193] In its opinion, the Chamber dealt with environmental impact assessment by referring to the *Pulp Mills* judgment. In answering the question submitted by the Council of the International Seabed Authority as to "what are the legal ... obligations of States Parties to the Convention [on the Law of the Sea] with respect to the sponsorship of activities in the Area ...", the Chamber singled out the obligation to conduct environmental impact assessments as one of the direct obligations incumbent on sponsoring States.[194] As the Chamber noted, under article 206 of the Convention and related instruments, such as regulation 31, paragraph 6, of the Regulations on

[188] Ibid., pp. 85, 87, paras. 210, 211, 219.

[189] Ibid., p. 83, para. 205.

[190] See the dissenting opinion of Judge ad hoc Vinuesa (at para. 65): "all of the consultations ... took place after environmental authorizations had been granted, and therefore all are meaningless".

[191] *Pulp Mills on the River Uruguay*, pp. 82-83, para. 204. Also see Cymie R. Payne, "Pulp Mills on the River Uruguay", *AJIL*, vol. 105 (2011), pp. 99-100.

[192] Elias, "Environmental impact assessment", op. cit., p. 236.

[193] The International Tribunal for the Law of the Sea, *Seabed Disputes Chamber, Responsibilities and Obligations of States Sponsoring Persons and Entities with respect to Activities in the Area*, Advisory Opinion, ITLOS, Case No. 17, para. 141f.

[194] Ibid., p. 44, para. 122.

Prospecting and Exploration for Polymetallic Nodules in the Area and regulation 33, paragraph 6, of the Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area adopted by the International Seabed Authority, sponsoring States have the obligation to conduct an environmental impact assessment.[195] However, the Chamber did not stop there and it stated that: "It should be stressed that the obligation to conduct an environmental impact assessment is a direct obligation under the Convention *and a general obligation under customary international law*" (emphasis added).[196] The Chamber deduced this statement from the *Pulp Mills* judgment,[197] and broadened the scope of the obligation to cover activities in the Area. According to the Chamber: "Although aimed at the specific situation under discussion by the Court [in the *Pulp Mills* case], the language used [by the International Court of Justice] seems broad enough to cover activities in the Area even beyond the scope of the Regulations. *The Court's reasoning [in the Pulp Mills case] in a transboundary context may also apply to activities with an impact on the environment in an area beyond the limits of national jurisdiction; and the Court's references to 'shared resources' may also apply to resources that are the common heritage of mankind*" (emphasis added).[198] Bearing the opinion in mind, it may be concluded that the obligation to conduct an environmental impact assessment under general international law also applies in the context of activities in an area beyond the limits of national jurisdiction.

57. The 2013 partial award of the *Indus Waters Kishenganga Arbitration (Pakistan v. India)* confirmed the obligation of the State under customary international law to undertake an environmental impact assessment in light of the judgments of the International Court of Justice in the *Gabčikovo-Nagymaros Project*, *Pulp Mills* and *Iron Rhine* cases.[199]

58. In the recent case of *Certain Activities carried out by Nicaragua in the Border Area* and *Construction of a Road in Costa Rica along the San Juan River*, the International Court of Justice reiterated its statement in the *Pulp Mills* case that "it may now be considered a requirement under general international law to undertake an environmental impact assessment".[200] The Court in the present case developed the content of the obligation held in the *Pulp Mills* case in three ways. First, although the statement by the Court in the *Pulp Mills* case refers to industrial activities undertaken by private companies, it concluded in the present case that the obligation of environmental impact assessment "applies generally to proposed activities which may have a significant adverse impact in a transboundary context",[201] and therefore applies to projects conducted by a State itself as well. Secondly, although the Court held in the *Pulp Mills* case that the obligation to carry out environmental impact assessments is a continuous one, the Court in that case put an emphasis on the obligation to conduct the assessment prior to undertaking an activity, stating that "the obligation to conduct an environmental impact assessment

[195] Ibid., p. 49, para. 142 and p. 50, para. 146.
[196] Ibid., p. 50, para. 145.
[197] Ibid., p. 51, para. 147.
[198] Ibid., p. 51, para. 148.
[199] PCA, *Indus Waters Kishenganga Arbitration*, Partial Award of 18 February 2013, paras. 450, 451 and 452. This was confirmed by the Final Award of 20 December 2013, para. 112.
[200] *Certain Activities carried out by Nicaragua in the Border Area, Judgment, I.C.J. Reports, 2015*, para. 104.
[201] Ibid.

requires an ex ante evaluation of the risk of significant transboundary harm".[202] Thirdly, the Court observed that the "reference to domestic law does not relate to the question of whether an environmental impact assessment should be undertaken".[203]

5. Customary international law

59. Based on the aforementioned international practice, there has been considerable support for the view that an environmental impact assessment is required as customary international law with regard to the activities or projects that may cause considerable transboundary environmental effects. Since the early 1980s, an environmental impact assessment is regularly required in a broad range of international instruments in case of potentially harmful activities: in addition, more than 130 countries have incorporated requirements for environmental impact assessments in their national legislation, so a rather uniform and continuous State practice exists. States also recognize that obligation as legally binding, at least as far as projects with potential transboundary effects are concerned. Therefore, at least the principle of requiring prior environmental assessment of projects, which may cause significant transboundary environmental harm, can be considered as international customary law. In other words, States have the obligation to conduct an environmental impact assessment if the following conditions are fulfilled: first, the project must be likely to have an impact on the environment; second, transboundary effects must be likely; third, the impact must be significant. Meanwhile, according to international practice, some indications with regard to the procedure of an environmental impact assessment have to be observed: first, the assessment should be carried out prior to the decision on the project; second, it must be carried out in such a manner that all relevant environmental impacts can be analysed and evaluated; third, public participation should be guaranteed in some way; fourth, in practice, the assessment is generally conducted by State authorities; and fifth, the result of an assessment must be taken into consideration when the competent authority decides on the realization of the project.[204] Concerning the conditions or indications mentioned above, some are still vague and lack details in many international instruments, even though some supranational instruments, such as directive 85/337/EEC,[205] contain more precise elements as to the procedure. However, those elements can hardly be said to reflect a real continuous practice, so that it is not possible at the present stage to formulate more precise conclusions as to the manner how to conduct an environmental impact assessment under customary international law.

60. While those observations primarily address the requirement of environmental impact assessment in transboundary contexts, it is uncertain, mainly for the lack of relevant precedents, whether the same applies to environmental impact assessment for projects intended to have significant effects on the global atmosphere, such as geo-engineering activities. It is submitted, however, that those activities are likely to carry a more extensive risk of "widespread, long-term and severe" damage than even those of transboundary harm and therefore that the same rules should a fortiori be applied to those activities potentially causing global atmospheric degradation.

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[202] Ibid., para. 161. It must be borne in mind, however, even in the *Pulp Mills* case the Court held that "an environmental impact assessment must be conducted prior to the implementation of a project". *Pulp Mills on the River Uruguay*, p. 83, para. 205.

[203] Ibid., para. 157.

[204] Epiney, "Environmental impact assessment", op. cit., pp. 588-590.

[205] See para. 42 above *supra*.

61. In view of the above, the following draft guideline is proposed:

Draft guideline 4: Environmental impact assessment

States have the obligation to take all necessary measures to ensure an appropriate environmental impact assessment, in order to prevent, mitigate and control the causes and impacts of atmospheric pollution and atmospheric degradation from proposed activities. The environmental impact assessment should be conducted in a transparent manner, with broad public participation.

III. Obligations of sustainable and equitable utilization of the atmosphere

A. Sustainable utilization of the atmosphere

1. The notion of sustainability in international law

62. The atmosphere was long considered to be non-exhaustible and non-exclusive, since it was assumed that everyone could benefit from it without depriving others.[206] That view is no longer held.[207] It must be borne in mind that the atmosphere is a limited resource with limited assimilation capacity. Even though the atmosphere is not exploitable in the traditional sense of the word (such as in the context of mineral or oil and gas resources), any polluter in fact exploits the atmosphere by reducing its quality and its capacity to assimilate pollutants, thus necessitating its proper maintenance for organisms to breathe and enjoy stable climatic conditions. If the atmosphere is a limited natural resource, it must be used in a sustainable manner. That is easy to say, but difficult to implement, since the normative character of sustainable development has not always been clear in international law. Sustainable development is a concept that seems to be widely supported in theory, but at the same time, there have been certain disagreements with regard to its actual application.[208]

63. The evolution of the notion of sustainable development is well summarized, for example, by the work of Nico Schrijver on the subject[209] and it will not be repeated in the present report. It may, however, be noted that the 1893 *Bering Sea*

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[206] As mentioned in A.CN.4/667, para. 84, footnotes 235 and 236, this appears quite similar to the classic 16th-17th century controversy between Hugo Grotius' *Mare Liberum* and John Selden's *Mare Clausum* over whether ocean resources were to be regarded as unlimited or limited.

[207] See the commentary to the preamble para. (2), *Official Records of the General Assembly, Seventieth Session, Supplement No. 10* (A/70/10), p. 25. The WTO Panel and Appellate Body recognized in the *Gasoline* case of 1996 that clean air was an "exhaustible natural resource" that could be "depleted". *United States — Standards for Reformulated and Conventional Gasoline* (1996), Report of the Appellate Body: WT/DS2/AB/R (1996).

[208] Duncan French, "Sustainable development", in Malgosia Fitzmaurice, et al., eds., *Research Handbook of International Environmental Law*, op. cit., pp. 51-68; Daniel Barstow Magraw and Lisa D. Hawke, et al., "Sustainable development", in Daniel Bodansky and David Freestone, eds., *Oxford Handbook of International Environmental Law* (Oxford: Oxford University Press, 2007), pp. 613638. See also Winfried Lang, ed., *Sustainable Development and International Law*, London: Graham & Trotman (1995), pp. 3-290; Konrad Ginther, et al., eds., *Sustainable Development and Good Governance* (Dordrecht: Martinus Nijhoff, 1995), pp. 1-22; Alan Boyle, et al., eds., *International Law and Sustainable Development*, op. cit., pp. 1-364.

[209] See Nico Schrijver, "The Evolution of sustainable development in international law: inception, meaning and status", *Recueil des cours*, vol. 329 (2007), pp. 217-412. See also, Dire Tladi, *Sustainable Development in International Law: An Analysis of Key Enviro-Economic Instruments* (Pretoria: Pretoria University Law Press, 2007), pp. 11-38.

Fur Seals arbitration was a precursor of the present-day notion of sustainable development.[210] The notion of sustainability in international law first appeared in the high sea fisheries agreements in the form of "maximum sustainable yield" in the 1950s.[211] The maximum sustainable yield was determined in principle by scientific evidence regarding the level of sustainable existence of a species, so that the total allowable catch of the species should not exceed that level. It is important to note that the notion of sustainability was based, in principle, on scientific data. In article 2 of the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas,[212] defined in article 2 the meaning of "conservation of the living resources of the high seas" is defined as "the aggregate of the measures rendering possible the *optimum sustainable yield* from those resources so as to secure a maximum supply of food and other marine products" (emphasis added). In the context of fisheries law the standard of maximum sustainable yield has subsequently been qualified with a view to limiting the total allowable catch. For example, the Convention on the Law of the Sea provides in article 61 (3) that the measures for conservation "shall also be designed to maintain or restore populations of harvested species at levels which can produce the *maximum sustainable yield, as qualified by relevant environmental and economic factors*, including the economic needs of coastal fishing communities and the special requirements of developing States" (emphasis added).[213] The qualifier is said to reflect the concern of the international community that the standard of maximum sustainable yield itself would not effectively ensure appropriate limits to prevent over-catching.[214] Thus, it can be said that the notion of sustainability, at least in high sea fisheries, is based on scientific knowledge but also on certain (non-scientific) policy considerations.

2. Treaties and other instruments

64. The first visible use of the term "sustainable development" in an international document appears to be the 1980 World Conservation Strategy prepared by the International Union for Conservation of Nature and Natural Resources, which

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[210] The arbitral tribunal adopted the "Regulations" for the sustainable conservation of the fur seal resources. *Moore's International Arbitral Awards*, vol. 1, p. 755. See, "Unilateral measures and the concept of opposability in international law", in Shinya Murase, *International Law: An Integrative Perspective on Transboundary Issues* (Tokyo: Sophia University Press, 2011), pp. 227-228.

[211] Para. 10 (a) of the Schedule to the 1946 International Convention on the Regulation of Whaling; article IV, paragraph 1 (b) (i) of the 1952 International Convention for the High Seas Fisheries of the North Pacific Ocean (*United Nations Treaty Series*, vol. 205, p. 2770); article 2, para. 1 (a) of the 1957 Interim Convention between the United States of America, Canada, Japan and the Union of Soviet Socialist Republics on Conservation of North Pacific Fur Seals (ibid., vol. 314, p. 4546).

[212] *United Nations Treaty Series*, vol. 559, p. 285. Done at Geneva on 29 April 1958, entered into force on 20 March 1966.

[213] Similar provisions can be found in article 119 (1) (a) of the UNCLOS; in article 5 (b) of the 1995 UN Agreement for Implementation of the Provisions of the UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks; in Section 7.2.1 of the 1995 FAO Code of Conduct on Responsible Fisheries; and in the 1992 UNCED, Agenda 21, chapter 17, para. 17 46 (b) concerning sustainable use and conservation of marine living resources of the high seas.

[214] J. F. Caddy and K. L. Cochrane, "A review of fisheries management past and present and some future perspectives for the third millennium", *Ocean and Coastal Management*, vol. 44 (2001), pp. 653-682; Chusei Yamada, et al., "Regarding the southern bluefin tuna case", *Jurist*, No. 1197 (2001), p. 66 (in Japanese).

defined sustainable development as "the integration of conservation and development to ensure that modifications to the planet do indeed secure the survival and wellbeing of all people".[215] The report by the World Commission on Environment and Development (Brundtland Commission), entitled *Our Common Future*, gave international prominence to the term "sustainable development".[216] Those two publications led to a significant "paradigm shift" in international environmental law.[217] The United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, in 1992, was the first occasion on which Governments officially adopted sustainable development as a global policy, which was confirmed in the Rio Declaration[218] and in Agenda 21.[219] The two important conventions adopted in Rio, namely, the United Nations Framework Convention on Climate Change[220] and the Convention on Biological Diversity (Biodiversity Convention),[221] provide for sustainable development. Article 3 of the Convention on Climate Change provides as a "principle" that: "The Parties have a right to, and should, promote sustainable development". Article 1 of the Biological Biodiversity Convention states that: "The objectives of this Convention ... are ... the conservation of biological diversity [and] the sustainable use of its components". In the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests,[222] also adopted in Rio, the global consensus on the management, conservation, and "sustainable development" of the world's forests is expressed. In 1994, sustainable development was recognized as an objective of the World Trade Organization (WTO) in the first preambular paragraph to the Marrakesh Agreement Establishing the WTO.[223] The fact that sustainable development is provided only as an "objective" or a "principle" in those instruments may imply that the term offers no more than a policy statement or guidance, rather than an operational code to determine rights and obligations among States.

3. Judicial decisions

65. In its decision on the case concerning the *Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)* in 1997, the International Court of Justice referred to the "need to reconcile environmental protection and economic development",[224] which is, in its opinion, "aptly expressed in the concept of sustainable development", although the Court never went further to analyse the normative character and status of the concept. On that point, Judge Weeramantry in his separate opinion considered sustainable development "to be more than a mere concept, but as a principle with

[215] IUCN, *World Conservation Strategy: Living Resources Conservation for Sustainable Development* (Gland: IUCN, 1980).
[216] World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press (1987), pp. 43-46.
[217] Tladi, *Sustainable Development in International Law*, op. cit., pp. 34-38.
[218] Rio Declaration, para. 14.
[219] Agenda 21, report of the UNCED, 1 (1992) A/CONF.151/26/Rev.1 (vol. I), p. 9.
[220] *United Nations Treaty Series*, vol. 1771, p. 107.
[221] *United Nations Treaty Series*, vol. 1760, p. 79.
[222] A/CONF.151/26/Rev.1 (vol. I), p. 480.
[223] *United Nations Treaty Series*, vol. 1867, p. 154.
[224] *I.C.J. Report 1997*, para. 140.

normative value which is crucial to the determination of this case",[225] a view shared by some with certain qualifications.[226] In the 2006 order of the *Pulp Mills Case (Argentina v. Uruguay)*, the International Court of Justice highlighted "the importance of the need to ensure environmental protection of shared natural resources while allowing for sustainable economic development", noting that "account must be taken of the need to safeguard the continued conservation of the river environment and the rights of economic development of the riparian States".[227] The judgment of 2010 on the same case reiterated the reference to sustainable development in the 2006 order cited above[228] and also that of the *Gabčíkovo-Nagymaros Project* judgment.[229]

66. The WTO Appellate Body decision of 1998 on *United States — Import Prohibition of Certain Shrimp and Shrimp Products* stated that, "recalling the explicit recognition by WTO Members of the objective of sustainable development in the preamble of the WTO Agreement, we believe it is too late in the day to suppose that article XX(g) of the GATT 1994 may be read as referring only to the conservation of exhaustible mineral or other non-living resources", and that: "As this preambular language reflects the intentions of negotiators of the WTO Agreement, we believe that it must add colour, texture and shading to our interpretation of the agreements annexed to the WTO Agreement, in this case, the GATT 1994".[230]

67. In the arbitral case of 2005 on the *Iron Rhine Railway (Belgium v. The Netherlands)*, the tribunal held as follows: "There is considerable debate as to what, within the field of environmental law, constitutes 'rules' or 'principles': what is 'soft law; and which environmental treaty law or principles have contributed to the development of customary international law ... The emerging principles, whatever their current status, make reference to ... sustainable development ... Importantly, these emerging principles now integrate environmental protection into the development process. Environmental law and the law on development stand not as alternatives but as mutually reinforcing, integral concepts, which require that where development may cause significant harm to the environment there is a duty to prevent, or at least mitigate such harm ... This duty, in the opinion of the Tribunal, has now become a principle of general international law."[231] In the 2013 partial award of the *Indus Waters Kishenganga Arbitration (Pakistan v. India)* the Court of Arbitration stated as follows: "There is no doubt that States are required under

[225] Separate Opinion of Judge Weeramantry, para. 104. He also stated that "the law necessarily contains within itself the principle of reconciliation. That principle is the principle of sustainable development", further noting that it is "a part of modern international law by reason not only of its inescapable logical necessity, but also by reason of its wide and general acceptance by the global community" (ibid.).

[226] See, Vaughn Lowe, "Sustainable development and unsustainable arguments", in Boyle, et al., eds., *International Law and Sustainable Development*, op. cit., pp. 19 et seq, in which sustainable development is characterized as a "meta-principle". See also, Dire Tladi, *Sustainable Development in International Law*, op. cit., pp. 94-109.

[227] *Pulp Mills on the River Uruguay, Indication of Provisional Order, I.C.J. Reports 2006*, p. 133, para. 80.

[228] Ibid., para. 75.

[229] Ibid., para. 76.

[230] Report of the WTO Appellate Body, AB-1998-4, WT/DS58/AB/R (12 October 1998), paras. 129, 131 and 153.

[231] PCA, *Iron Rhine Arbitration*, 2005, paras. 58-60.

contemporary customary international law to take environmental protection into consideration when planning and developing projects that may cause injury to a bordering State. Since the time of *Trail Smelter*, a series of international ... arbitral decisions have addressed the need to manage natural resources in a sustainable manner. In particular, the International Court of Justice expounded upon the principle of 'sustainable development' in *Gabčíkovo-Nagymaros*, referring to the 'need to reconcile economic development with protection of the environment.'"[232]

68. Thus, with regard to the question of whether the "concept" of sustainable development has evolved as a "principle", the trend seems definitely to be leading to its recognition of its legal character as an "emerging principle" under customary international law. However, in view of a certain ambiguity remaining as to its legal status, the Commission may wish to opt for the term "should" in referring to sustainable utilization of the atmosphere, as follows:

Draft guideline 5: Sustainable utilization of the atmosphere

1. **Given the finite nature of the atmosphere, its utilization should be undertaken in a sustainable manner.**

2. **For sustainable utilization of the atmosphere, it is required under international law to ensure a proper balance between economic development and environmental protection.**

B. Equitable utilization of the atmosphere

1. The notion of equity in international law

69. Equity and sustainable development are two notions frequently employed as inherently interrelated concepts in international environmental law, and in the law of the atmosphere in particular, since equitable use of the atmosphere is a corollary of its sustainable use.[233] While equity addresses distributive justice in allocating resources on the one hand, it also refers to distributive justice in allocating burdens on the other hand,[234] and therefore, the relationship between the two within the concept of equity should also be taken into account.

70. Equity has been a long-standing concern in general international law, within which diverse meanings of the concept have been discussed.[235] While it is difficult

[232] PCA, *Indus Waters Kishenganga Arbitration*, Partial Award of 18 February 2013, para. 449. This was confirmed by the Final Award of 20 December 2013, para. 111.

[233] For example, the Copenhagen Accord of the UNFCCC COP-15 in 2009 stated that those who associate with the Accord agree "on the basis of equity and in the context of sustainable development" to enhance long-term cooperative action to combat climate change (Decision 2/CP. 15, Copenhagen Accord, in FCCC/CP/2009/11/Add.1, 30 March 2010). The Paris Agreement adopted by the UNFCCC COP-21 on 12 December 2015 emphasized the "intrinsic relationship" of "equitable access to sustainable development" in its 8th preambular paragraph (FCCC/CP/2015/L.9).

[234] Dinah Shelton, "Equity" in Daniel Bodansky, et al., *Oxford Handbook of International Environmental Law* (Oxford: Oxford University Press, 2007), pp. 639-662.

[235] Michael Akehust, "Equity and general principles of law", *ICLQ*, vol. 25 (1976), pp. 801-825; Francesco Francioni, "Equity in international law", in Rüdiger Wolfrum, ed., *Encyclopedia of Public International Law*, vol. III (Oxford, Oxford University Press, 2012), pp. 632-642; M. W. Janis, "Equity in international law", in ibid., vol. II (Amsterdam: North-Holland, 1995), p. 109.

to define, equity in international law has been equated by the International Court of Justice to "a direct emanation of the idea of justice".[236] The notion conveys "considerations of fairness and reasonableness often necessary for the application of settled rules of law".[237] The International Court of Justice referred to the concept in its Chamber judgment of 1985 in the *Frontier Dispute* (*Burkina Faso v. Mali*) case,[238] in which the Court recalled that there were three categories of equity in international law: (a) equity *infra legem* (within the law), (b) equity *praeter legem* (outside, but close to, the law) and (c) equity *contra legem* (contrary to law). Equity *infra legem*, according to the judgment, is "that form of equity which constitutes a method of interpretation of the law in force, and is one of its attributes".[239] The notion of equity *praeter legem* is particularly important for its function of filling gaps in existing law.[240] Equity *contra legem* (contrary to the law) is similar to settlement *ex aequo et bono* (see article 38, paragraph 2 of the Statute of the International Court of Justice), which may, upon agreement of the parties concerned, serve as a mechanism to correct existing legal rules that might otherwise lead to an unreasonable or unjust consequence, but it should be distinguished from the interpretation and application of existing law.

71. In the context of international environmental law, equity has a dual dimension.[241] On the one hand, it postulates an equitable global "North-South" balance, reflected in the concept of "common but differentiated responsibilities" (formulated in principle 7 of the Rio Declaration and in several multilateral environmental agreements). On the other hand, it calls for an intergenerational equitable balance between the present generation and future generations of humankind, highlighted by the seminal definition report of the World Commission on Environment and Development: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[242]

2. Treaties and other instruments

72. Provisions concerning equity and equitable principles are crucial in many global multilateral treaties. According to its preamble, the Montreal Protocol on

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[236] *Continental Shelf (Tunisia* v. *Libyan Arab Jamahiriya), Judgment, I.C.J. Reports 1982*, p. 46, para. 71.

[237] James R. Crawford, SC, FBA, *Brownlie's Principles of Public International Law, 8th edition* (Oxford: Oxford University Press, 2012), p. 44. See also Thomas Franck, *Fairness in International Law and Institutions* (Oxford: Clarendon Press, 1995).

[238] *Frontier Dispute (Burkina Faso* v. *Mali), Judgment, I.C.J. Reports 1986*, p. 554.

[239] Ibid.

[240] See in general Prosper Weil, "L'équité dans la jurisprudence de la Cour Internationale de Justice: Un mystère en voie de dissipation?", in Vaughan Lowe and Malgosia Fitzmaurice, eds., *Fifty Years of the International Court of Justice: Essays in Honour of Sir Robert Jennings* (Cambridge: Cambridge University Press, 1996), pp. 121-144; Juliane Kokott, "Equity in international law", in Ferenc L. Toth, ed., *Fair Weather? Equity Concerns in Climate Change* (London: Earthscan, 1999), pp. 186-188; Dinah Shelton, "Equity", in Daniel Bodansky, et al., eds., *Oxford Handbook of International Environmental Law*, op. cit., pp. 639-662, at 642.

[241] Shelton, ibid., at pp. 640-645.

[242] *Our Common Future* (Oxford: Oxford University Press, 1987), at p. 43. See also Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Tokyo: United Nations University Press, 1989); and Claire Molinari, "Principle 3: From a Right to Development to Intergenerational Equity", in Duvic-Paoli and Vinuales, *The Rio Declaration on Environment and Development*, op. cit., pp. 139-156.

Substances that Deplete the Ozone Layer to the Vienna Convention on the Protection of the Ozone Layer of 1985, purports to "control equitably total global emissions". The United Nations Framework Convention on Climate Change[243] recognizes in article 3 (1) that: "The Parties should protect the climate system for the benefit of present and future generations of humankind", and "on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities". Article 4 (2) (a) of the Convention provides that: "Each of these [Annex I] Parties shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs ... taking into account ... the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective", and most recently, the Paris Agreement, adopted by the parties to the Convention on 12 December 2015, stipulates in article 2 (2) that it "will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances". The 1992 Convention on Biological Diversity sets forth, among its objectives in article 1, "the fair and equitable sharing of the benefits arising out of the utilization of genetic resources".[244] Similarly, the 1994 Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (1994)[245] repeatedly emphasizes benefit sharing "on an equitable basis and on mutually agreed terms" (see article 16 (g), article 17 (1) (c) and article 18 (2) (b)).

73. Explicit reference to equity is contained in the United Nations Convention on the Law of the Sea: (a) the preamble affirms among the goals of the Convention "the equitable and efficient utilization" of the ocean's resources, "Bearing in mind that the achievement of these goals will contribute to the realization of a just and equitable international economic order which takes into account the interests and needs of mankind as a whole and, in particular, the special interests and needs of developing countries, whether coastal or land-locked"; (b) articles 74 (1) and 83 (1) provide for an "equitable solution" of disputes; (c) articles 69 (1) and 70 (1) provide for participation "on an equitable basis"; (d) 82 (4), 140 (2) provide for "equitable sharing" in the exploitation of resources; and (e) 155 (2) provides for "equitable exploitation of the resources of the Area for the benefit of all countries".

74. Similar provisions also exist in regional treaties and instruments. The ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes of 1992 provides that the parties "shall take all appropriate measures ... to ensure that transboundary waters are used in a reasonable and equitable way" (article 2 (2) (c)). The Danube River Protection Convention of 1994 sets forth the goals of "sustainable and equitable water management" in article 2 (1), and provides that the contracting parties "shall take appropriate measures aiming at the prevention or reduction of transboundary impacts and at a sustainable and equitable use of water resources as well as at the conservation of ecological resources" (article 6 (a)).[246] The Agreement on the Cooperation for the

[243] *United Nations Treaty Series*, vol. 1771, p. 107.
[244] Ibid., vol. 1760, p. 79.
[245] Ibid., vol. 1954, p. 3.
[246] Article 6 (a) Convention on Cooperation for the Protection and Sustainable use of the Danube River, done at Sofia on the 29th day of June 1994. See http://www.icpdr.org/main/icpdr/danube-river-protection-convention.

Sustainable Development of the Mekong River Basin of 1995[247] provides for "reasonable and equitable utilization" of the waters of the Mekong River system (article 5). The Revised Protocol on Shared Watercourses in the Southern African Development Community of 2000[248] highlights the equitable utilization of shared watercourse systems in the region (preamble, articles 2 (a), 3 (7) and 3 (8)). Similar provisions can also be found in the Framework Convention on the Protection and Sustainable Development of the Carpathians of 2003, which aims to take measures for "sustainable, balanced and equitable water use" (article 6 (b)).[249]

3. Previous work of the Commission

75. The previous work of the Commission in relation to equity should be noted. Article 5 ("Equitable and reasonable utilization and participation") of the Articles on the Law of the Non-navigational Uses of International Watercourses of 1994[250] (adopted as a convention in 1997), provides that watercourse States "shall in their respective territories utilize an international watercourse in an *equitable and reasonable manner*" and "shall participate in the use, development and protection of an international watercourse in an *equitable and reasonable manner*"[251] (emphasis added). The International Law Commission articles on the law of transboundary aquifers (2008) have similar provisions in article 4 ("Equitable and reasonable utilization") to the effect that: "Aquifer States shall utilize transboundary aquifers or aquifer systems according to the principle of equitable and reasonable utilization".[252]

76. The articles on prevention of transboundary harm from hazardous activities of 2001 provide that: "The States concerned shall seek solutions based on an equitable balance of interests in the light of article 10" (draft article 9 (2)). Article 10 ("Factors involved in an equitable balance of interests") provides as follows: "In order to achieve an equitable balance of interests as referred to in paragraph 2 of article 9, the States concerned shall take into account all relevant factors and circumstances, including: (a) the degree of risk of significant transboundary harm and of the availability of means of preventing such harm, or minimizing the risk thereof or repairing the harm; (b) the importance of the activity, taking into account its overall advantages of a social, economic and technical character for the State of origin in relation to the potential harm for the State likely to be affected; (c) the risk of significant harm to the environment and the availability of means of preventing such harm, or minimizing the risk thereof or restoring the environment; (d) the degree to which the State of origin and, as appropriate, the State likely to be affected are prepared to contribute to the costs of prevention; (e) the economic viability of the activity in relation to the costs of prevention and to the possibility of carrying out the activity elsewhere or by other means or replacing it with an

[247] The parties are: Cambodia, Laos and Thailand. See http://www.mrcmekong.org/assets/Publications/policies/agreement-Apr95.pdf.

[248] http://www.sadc.int/files/3413/6698/6218/Revised_Protocol_on_Shared_Watercourses_-_2000_-_English.pdf.

[249] Article 6 (b) Framework Convention on the Protection and Sustainable Development of the Carpathians, see http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/01%20The%20Convention/1.1.1.1_CarpathianConvention.pdf.

[250] *Yearbook* ... 1994, vol. II (Part Two), p. 117.

[251] See also article 6 for "factors relevant to equitable and reasonable utilization", and the commentaries thereto. Ibid., paras. 218 and 222.

[252] *Official Records of the General Assembly, Sixty-third Session, Supplement No. 10* (A/63/10), paras. 53 and 54.

alternative activity; (f) the standards of prevention which the State likely to be affected applies to the same or comparable activities and the standards applied in comparable regional or international practice."

4. Judicial decisions

77. The International Court of Justice has also invoked the rules of equity, particularly in the context of maritime disputes. In considering Germany's concave coastline, the Court, in the 1969 judgment of the *North Sea Continental Shelf* cases, resorted to equity as a principle for the delimitation of continental shelves, rather than supporting the application of the equidistance rule which would, in its opinion, lead to a substantively unjust result. The Court stated that: "Whatever the legal reasoning of a court of justice, its decisions must by definition be just, and therefore in that sense equitable"; and that it "was not applying equity simply as a matter of abstract justice, but applying a rule of law which itself requires the application of equitable principles".[253] That judgment of the *North Sea Continental Shelf* cases was followed by subsequent maritime delimitation or resource allocation cases. They include: the *Fisheries Jurisdiction* cases (*United Kingdom of Great Britain and Northern Ireland* v. *Iceland and Federal Republic of Germany* v. *Iceland*) of 1974,[254] the arbitration on the delimitation of the continental shelf between the United Kingdom and France of 1977 and 1978,[255] the Tunisia-Libyan Arab Jamahiriya continental shelf case of 1982;[256] the Gulf of Maine Area case of 1984;[257] the Libyan Arab Jamahiriya-Malta continental shelf case of 1985;[258] the

[253] *North Sea Continental Shelf Cases (Federal Republic of Germany* v. *Denmark); (Federal Republic of Germany* v. *Netherlands), Judgment, I.C.J. Reports 1969*, paras. 85 and 88.

[254] *Fisheries Jurisdiction Cases (United Kingdom* v. *Iceland; Federal Republic of Germany* v. *Iceland), Judgment, I.C.J. Reports 1974*, pp. 3f. The Court stressed that "[n]either right is an absolute one" and that both parties should take into account the rights of other states and the needs of conserving the fish stocks (paras. 63, 71). "[B]oth Parties have the obligation to keep under review the fishery resources in the disputed waters and to examine together, in the light of scientific and other available information, the measures required for the conservation and development, and equitable exploitation, of those resources ..." (paras. 64, 71), the Court emphasized, restating its similar standpoint expressed in the *North Sea Continental Shelf* cases, that "[i]t is not a matter of finding simply an equitable solution, but an equitable solution derived from the applicable law" (paras. 69, 78).

[255] *UNRIAA*, vol. 18 (2006), p. 57, para. 99.

[256] *Tunisia-Libya Continental Shelf Case*, *I.C.J. Reports*, *1982*. The Court called for not only the application of equitable principles, but an equitable result derived from the application of equitable principles. "The equitableness of a principle must be assessed in the light of its usefulness for the purpose of arriving at an equitable result. It is not every such principle which is in itself equitable; it may acquire this quality by reference to the equitableness of the solution. The principles to be indicated by the Court have to be selected according to their appropriateness for reaching an equitable result" (para. 70). Furthermore, the Court took into account relevant circumstances to "meet the requirements of the test of proportionality as an aspect of equity" (para. 131).

[257] *Delimitation of the Maritime Boundary in the Gulf of Maine Area (Canada* v. *United States of America), Judgment, I.C.J. Reports 1984*. After a detailed discussion, the Chamber drew the conclusion that "the delimitation effected in compliance with the governing principles and rules of law, applying equitable criteria and appropriate methods accordingly, has produced an equitable overall result" (para. 241).

[258] In the 1985 *Continental Shelf Case (Libyan Arab Jamahiriya* v. *Malta)*, the Court affirmed the importance of "[t]he normative character of equitable principles applied as a part of general international law", the reason being that "these principles govern not only delimitation by adjudication or arbitration, but also, and indeed primarily, the duty of Parties to seek first a delimitation by agreement, which is also to seek an equitable result", *Judgment, I.C.J. Reports 1985*, para. 46.

Maritime Delimitation and Territorial Questions between Qatar and Bahrain case of 2001.[259] In an environmental context, the concept of intergenerational equity has been elaborated, in particular, in the opinions of Judge Cançado-Trindade.[260]

78. On the basis of the foregoing, the following draft guideline is proposed:

Draft guideline 6: Equitable utilization of the atmosphere

States should utilize the atmosphere on the basis of the principle of equity and for the benefit of present and future generations of humankind.

5. Relation of equity with the need for special consideration for developing countries

79. Equity does not mean equality and usually the truth is that "relevant dissimilarities warrant adjustment or special treatment"[261] for the sake of a result-oriented equity. The concept of common but differentiated responsibilities might have been such an attempt, by adopting an equitable approach, to foster substantive equality in international environmental law. It entails that "while pursuing a *common goal*, States take on *different obligations*, depending on their socioeconomic situation and their historical contribution to the environmental problem at stake" (emphasis added).[262] That phenomenon is not new in international law. The first such attempt was probably the Washington Conference of the International Labour Organization in 1919, at which delegations from Asia and Africa succeeded in ensuring the adoption of differential labour standards.[263]

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[259] In the 2001 case between Qatar and Bahrain, the Court, after weighing "whether there are special circumstances which make it necessary to adjust the equidistance line as provisionally drawn in order to obtain an equitable result", applied the equidistance rule in view of the special geographical circumstances as the equitable solution. *Maritime Delimitation and Territorial Questions between Qatar and Bahrain (Qatar v. Bahrain), Judgment, I.C.J. Reports 2001*, para. 217.

[260] See his separate opinions in the cases of *Pulp Mills on the River Uruguay* (Judgment), pp. 177-184, paras. 114-131, and *Whaling in the Antarctic, I.C.J. Reports 2014*, pp. 362-367, paras. 41-47.

[261] Shelton, "Equity" in Daniel Bodansky, et al., *Oxford Handbook of International Environmental Law* (2007), op. cit., p. 647.

[262] Ellen Hey, "Common but differentiated responsibilities", in *Encyclopedia of Public International Law*, vol. II (Oxford: Oxford University Press, 2012), pp. 444-448.

[263] See Iwao Ayusawa, *International Labor Legislation* (Studies in History, Economics and Public Law, vol. XCI, No. 2) (New York: Columbia University, 1920), pp. 149f. He wrote that the third point of the President Wilson's Fourteen Points, "[t]he removal of all economic barriers and the establishment of an equality of trade conditions among all nations" was "an empty phrase", and stressed that varied economic conditions require differential treatment in labor legislation (chapter VI, pp. 149 *et seq*), which was recognized in the Washington Conference of 1919 concerning the working conditions of workers in Asian and African countries including his own country Japan (Chapter VII, pp. 173f.). Long before the advent of the CBDR concept, this was in fact the first attempt in international law-making for asserting differentiated treatment, on the basis of article 405(3) of the 1919 Versailles Peace Treaty, which became article 19(3) of the ILO Constitution (labour conventions "shall have due regard" to the special circumstances of countries where local industrial conditions are "substantially different"). The same principle also appeared in some of the Conventions approved by ILO in 1919 and in several Conventions adopted after Dr. Ayusawa's article. While Ayusawa did not originate the idea of differential treatment, he was one of the first scholars to take note of the principle as a normative dictate and to link it more generally to substantive equality of treatment in international economic law. In his later years in the 1960s, Dr. Ayusawa served as professor at International Christian University in

Another example is the Generalized System of Preferences elaborated under the United Nations Conference on Trade and Development in the 1970s.[264]

80. The need for special consideration for developing countries in the context of environmental protection has been endorsed by a number of international instruments, such as the Stockholm and Rio Declarations. Principle 12 of the Stockholm Declaration attaches importance to "taking into account the circumstances and particular requirements of developing countries". Principle 6 of the Rio Declaration highlights the special needs of developing countries and particularly the least developed and those most environmentally vulnerable, while Principle 7 provides that: "In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities".

81. The concept of common but differentiated responsibilities is reflected in the provisions of several multilateral environmental agreements, starting with the United Nations Framework Convention on Climate Change.[265] Article 3 (1) provides that: "The Parties should protect the climate system ... on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities."[266] In the Kyoto Protocol of 1997, the parties adopted a strict dictate of the concept of common but differentiated responsibilities, imposing obligations to mitigate or stabilize greenhouse gas emissions only on the developed, industrialized States (Annex I parties), leaving the developing countries without new legally binding obligations. However, at the seventeenth session of the Conference of the Parties in 2011, it was decided to launch a process to develop a legal instrument which would be applicable to all parties. It is noteworthy that there is no longer any reference here to the concept of common but differentiated responsibilities. Indeed, the Paris Agreement of 2015 obliges all parties to undertake the commitments made thereunder (article 3). It should be noted, however, that, the parties are still to be guided by "equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances" (third preambular paragraph, article 2 (2) and article 4 (3)).

82. Since there are various situations affecting the allocation of shared or common resources and the burden of environmental protection, as mentioned before, equal treatment "may yield extreme outcomes when pre-existing economic or other

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Tokyo where he gave courses on international labour law as well as international relations. The present writer, then a freshman student, had the privilege to attend one of his courses in which he lectured with passion and enthusiasm North-South problems, which he considered a top-priority agenda for the post-war world. (The Special Rapporteur is deeply grateful to Professor Steve Charnovitz of George Washington University School of Law for drawing his attention to the contribution made by Dr. Ayusawa.)

[264] See article 23 (The most-favoured-nation clause in relation to treatment under a generalized system of preferences) and article 30 (New rules of international law in favour of developing countries) of the 1978 ILC draft Articles on the most-favoured-nation clauses, *Yearbook* ... 1978, vol. II, Part Two, paras. 47-72. Shinya Murase, *Economic Basis of International Law*, Tokyo: Yuhikaku (2001), pp. 109-179 (in Japanese). Tuula Honkonen, *The Common But Differentiated Responsibilities Principle in Multilateral Environmental Agreements: Regulatory and Policy Aspects* (Alphen: Kluwer Law International, 2009), at pp. 49-66. And see the earlier exceptions for developing countries specified in article XVIII of the 1947 General Agreement on Tariffs and Trade (GATT), *United Nations Treaty Series*, vol. 55, p. 194.

[265] See Christopher D. Stone, "Common but differentiated responsibilities in international law", *AJIL*, vol. 98 (2004), pp. 276-301, at p. 279.

[266] *United Nations Treaty Series*, vol. 1771, p. 107.

inequalities exist in society".[267] Equality of rights "does not necessarily bring about equality of outcomes", and therefore, international environmental law has moved considerably away from "formal equality towards grouping states" to "allocate burdens and benefits based on responsibility for harm and financial or technological capacity to respond".[268] That is the background against which the concept of common but differentiated responsibilities was considered necessary. It may be noted however that the concept leaves an inherent ambiguity as to the basis of the proposed differentiation.[269] Furthermore, in the context of climate change, there has been a certain regression in the application of the concept, as exemplified by the Durban Platform for Enhanced Action of 2011 that ultimately led to the adoption of the Paris Agreement in 2015, recognizing the obligations thereunder as being applicable to all States (article 3).

83. It may be recalled that, in adopting the present topic in 2013, the Commission stated its understanding that "the topic will not deal with, *but is also without prejudice to*, questions such as ... common but differentiated responsibilities ..." (emphasis added). While the exact meaning of this "double negative" expression remains uncertain,[270] it may be noted that the words "but is also without prejudice to" were inserted with the agreed intention that the concept of common but differentiated responsibilities should be included in the draft guidelines. However, given that respect for the needs of developing countries remains significant in international law but not necessarily in the form of common but differentiated responsibilities, the Special Rapporteur proposes a guiding principle in the preamble, modelled after the ninth paragraph of the preamble of the draft articles on the law of transboundary aquifers of 2008, as follows:

Draft preambular paragraph 4

"Emphasizing the need to take into account the special situation of developing countries"

C. Legal limits on intentional modification of the atmosphere

84. The atmosphere has been used in several ways, most notably in the form of aerial navigation. Obviously, most of the activities so far are those conducted

[267] Shelton, "Equity" in Daniel Bodansky, et al., eds., *Oxford Handbook of International Environmental Law* (2007), op. cit., p. 655.

[268] Ibid.

[269] There are a variety of views as to the grounds and criteria for differentiated treatment such as the "contribution theory" (industrialized countries generating the largest share of historical and current global emissions of greenhouse gases are responsible for the global environmental degradation and hence should bear the costs of clean up), "entitlement theory" (developing countries are entitled to fewer and less stringent commitments and financial/technical assistances, in the light of the history of colonialism and exploitation as well as necessity of development), "capacities theory" (developed countries having resources and capacities to take responsive measures should lead to the environmental protection) and "promotion theory" (differentiation tailoring commitments for different situations of each country is necessary to promote a large participation in international treaties). See, Lavanya Rajamani, *Differential Treatment under International Environmental Law* (Oxford: Oxford University Press, 2006), pp. 2, 118-125. See also, Philippe Cullet, "Common but differentiated responsibilities", in Malgosia Fitzmaurice, et al., eds., *Research Handbook on International Environmental Law*, op. cit., pp. 161-181.

[270] See para. 6 and footnote 18 above.

without a clear or concrete intention to affect atmospheric conditions. There are, however, certain activities whose very purpose is to alter atmospheric conditions, for example, weather modification (weather control). Weather modification is an example of utilization of the atmosphere that has already been practised domestically. Additionally, ocean fertilization for CO_2 absorption has been conducted on a limited experimental basis. Scientists have suggested various possible methods for active utilization of the atmosphere. Some of the proposed geo-engineering technologies (such as carbon dioxide removal and solar radiation management) are relevant if they become realizable. Thus, it is considered that the modalities of the use (or utilization) of the atmosphere and their legal implications should be carefully studied in the present report.

85. Weather modification "in warfare" has been prohibited under the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques of 1976 (Environmental Modification Convention, ENMOD).[271] The Convention does not deal with the question of whether or not a given use of environmental modification techniques for peaceful purposes is in accordance with generally recognized principles and applicable rules of international law. Nonetheless, as the only international instrument to directly regulate deliberate manipulation of natural processes, which have "widespread, long-lasting or severe effects" (article 1) of a transboundary nature, the Convention is considered to offer one possible route towards the prohibition of large-scale geo-engineering practices. Weather control has been experimented with and practised widely in domestic settings since the 1940s to produce desirable changes in weather. The General Assembly first addressed the issue in 1961.[272] The goals of weather control range from preventing the occurrence of harmful meteorological events, such as hurricanes or tornadoes, to causing beneficial weather, such as artificial rainfall in an area experiencing drought; or, conversely, for temporary avoidance of rainfall in a designated area where an important event is scheduled to take place. Cloud seeding is a common technique to enhance precipitation; it entails spraying small particles such as dry ice and silver iodide into the sky in order to trigger cloud formation for eventual rainfall. Evidence of safety is widely believed to be strong, but doubts remain as to its efficacy. The Governing Council of UNEP approved a set of recommendations for consideration by States and other weather modification operators in 1980.[273] If

[271] Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, adopted at New York on 10 December 1976, *United Nations Treaty Series*, vol. 1108, p. 151, entered into force on October 1978.

[272] The General Assembly, in resolution 1721 (XVI) on "International co-operation in the peaceful uses of outer space" (1961), para. C 1 (a), advised Member States and other relevant organizations: "To advance the state of atmospheric science and technology so as to provide greater knowledge of basic physical forces affecting climate and the possibility of large-scale weather modification".

[273] Decision 8/7/A of the UNEP Governing Council, Provisions for Co-operation between States in Weather Modification, 6th session, 29 April 1980. It may be noted that, as early as 1963, the World Meteorological Organization (WMO) had called for a prudent approach to weather modification technologies, stating as follows: "The complexity of the atmospheric processes is such that a change in the weather induced artificially in one part of the world will necessarily have repercussions elsewhere. This principle can be affirmed on the basis of present knowledge of the mechanism of the general circulation of the atmosphere. However, that knowledge is still far from sufficient to enable us to forecast with confidence the degree, nature or duration of the secondary effects to which change in weather or climate in one part of the Earth may give rise elsewhere, nor even in fact to predict whether these effects will be beneficial or detrimental. Before undertaking an experiment on large-scale weather modification, the possible and desirable consequences must be carefully evaluated, and satisfactory international arrangements

large-scale weather control were to become feasible in the future, there could be some harmful consequences. Potential negative implications may include unintended side effects, damage to existing ecosystems and health risks to humans. Those effects, if transboundary in nature, could generate international concern for their injurious consequences.[274] It is suggested that progressive development of international law in that particular area should be pursued.[275]

86. Geo-engineering is commonly understood as the "intentional large-scale manipulation of the global environment".[276] In the context of climate change, geo-engineering refers to "a broad set of methods and technologies that aim to deliberately alter the climate system in order to alleviate the impacts of climate change".[277] To combat global warming, reducing the emission of greenhouse gases is the primary solution.[278] However, in view of the fact that reducing greenhouse gas emission has not been fully achieved,[279] extracting existing greenhouse gases, especially carbon dioxide, is considered to be an alternative solution.[280] Afforestation is a traditional measure to reduce carbon dioxide and has been incorporated in the

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must be reached." WMO, *Second Report on the Advancement of Atmospheric Sciences and Their Application in the Light of Developments in Outer Space* (Geneva: WMO Secretariat, 1963). See Rita F. and Howard J. Taubenfeld, "Some international implications of weather modification activities", *International Organization*, vol. 23, No. 4 (1969), pp. 808-833, at 811.

[274] Lada L. Roslycky, "Weather modification operations with transboundary effects: the technology, the activities and the rules", *Hague Yearbook of International Law*, vol. 16 (2003), pp. 3-40; Peter H. Sand, "Internationaler Umweltschutz und neue Rechtsfragen der Atmosphärennutzung", *Zeitschrift für Luft-und Weltraumrecht* (German Air and Space Law Journal), vol. 20, No. 2 (1971), pp. 109-133. See also, H. J. Taubenfeld, "International environmental law: air and outer space", in L. A. Teclaff and A. E. Utton, eds., *International Environmental Law* (New York: Praeger, 1974), p. 195; Edith Brown Weiss, "International responses to weather modification", International Organization, vol. 29 (1975), pp. 805-826, at p. 813.

[275] It has been suggested that the following points should be considered in the regulation of weather modification: the duty to benefit the common good of mankind; the duty not to cause significant transboundary harm; the duty to perform environmental impact assessments; public participation; the duty to co-operate; exchange of information and notification; consultation; the duty to utilize international organizations; and State responsibility; Roslycky, op. cit., at 27-40. See also Ray J. Davis, "The international law of the hydroscopic cycle: atmospheric water resources development and international law", *Natural Resources Journal* vol. 31 (1991), pp. 11-44, at 17.

[276] David W. Keith, "Geoengineering", in Andrew S. Goudie et al., eds., *Encyclopedia of Global Change: Environmental Change and Human Society* (Oxford: Oxford University Press, 2001), p. 495.

[277] Intergovernmental Panel on Climate Change, report on the IPCC Expert Meeting on Geoengineering, June 2011. See also generally the Oxford Geo-engineering Programme, www.geoengineering.ox.ac.uk/what-is-geoengineering/what-is-geoengineering/; Parson, Edward A, "Climate Engineering: Challenges to International Law and Potential Responses", www.questia.com/library/journal/1G1-326981407/climate-engineering-challenges-to-international-law; Jesse Reynolds, "The International Legal Framework for Climate Engineering", http://geoengineeringourclimate.com/2015/03/26/the-international-legal-framework-for-climate-engineering-working-paper/; Clive Hamilton, *Earthmasters: The Dawn of the Age of Climate Engineering* (New Haven, Yale University Press, 2013).

[278] www.epa.gov/climatechange/ghgemissions/; John Shepherd et al., "Geoengineering the Climate: Science, Governance and Uncertainty" (London: Royal Society, 2009), available at https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2009/8693.pdf.

[279] John Shepherd et al., "Geoengineering the Climate: Science, Governance and Uncertainty" (London: Royal Society, 2009) at p. 1, available at https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2009/8693.pdf.

[280] Johannes Urpelainen, "Geoengineering and global warming: a strategic perspective", *International Environmental Agreements: Politics, Law and Economics* vol. 12, issue 4 (2012), pp. 375-389.

Kyoto Protocol regime as a valuable climate change mitigation measure.[281] That measure has been recognized in the decisions adopted at various sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change: in Copenhagen in 2009[282] and Cancun, Mexico, in 2010[283] and in article 5 (2) of the Paris Agreement. New incentives were created to reduce emissions from deforestation and forest degradation in developing countries.[284]

87. Generally, global warming reduction-oriented geo-engineering can be divided into two categories: carbon dioxide removal and solar radiation management.[285] The carbon dioxide removal techniques are designed to remove carbon dioxide from the atmosphere, directly countering the increased greenhouse effect and ocean acidification.[286] Those techniques would probably need to be implemented on a global scale to have a significant impact on carbon dioxide levels in the atmosphere. The proposed techniques include: (a) "soil-carbon sequestration", also known as "biochar", which is to char biomass and bury it so that its carbon is locked up in the soil,[287] which, however, was not endorsed in the Kyoto Protocol;[288] and (b) "carbon capture and storage", referring to a set of technologies to capture carbon dioxide (CO_2) emissions from large-point sources, such as coal-fired power plants,[289] with the captured CO_2 to be stored in geological reservoirs or in the oceans.[290] (The long-term advantage of carbon capture and storage is that the sequestration costs can be partially offset by revenues from oil and gas production,[291] while its disadvantage is also recognized — since the CO_2 stored underground may escape, it could cause explosions.)[292] Under some international legal instruments, measures have recently been adopted for regulating carbon capture and storage. For example, the 1996 Protocol to the 1972 London Convention now includes an amended provision and annex, as well as new guidelines for controlling the dumping of wastes and other matter. Those amendments created a legal basis in international environmental law for regulating carbon capture

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[281] Josep G. Canadell & Michael R. Raupach, "Managing forests for climate change mitigation", Science vol. 320 (2008), pp. 1456, 1456-57; Leonard Ornstein et al., "Irrigated afforestation of the Sahara and Australian outback to end global warming", *Climatic Change*, vol. 97 (2009), pp. 409, 410; Kenneth R. Richards and Carrie Stokes, "A review of forest carbon sequestration cost strategies: a dozen years of research", *Climatic Change*, vol. 63 (2004), pp. 24, 25.

[282] *Report of the Conference of the Parties on its fifteenth session, Addendum. Part Two: Action taken by the Conference of the Parties at its fifteenth session*, FCCC/CP/2009/11/Add.1 (30 March 2010), pp. 11f.

[283] *Report of the Conference of the Parties on its sixteenth session, Addendum Part Two: Action taken by the Conference of the Parties at its sixteenth session*, FCCC/CP/2010/7/Add.1 (15 March 2011).

[284] Ibid.

[285] Brian P. Flannery et al., "Geoengineering climate", in Robert G. Watts, ed., *Engineering Response to Global Climate Change: Planning a Research and Development Agenda* (Boca Raton/Florida: CRC Press, 1997), p. 381; Jason Blackwell and Jane C. S. Long, "The politics of geoengineering", Science, vol. 327 (29 January 2010), p. 527.

[286] www.geoengineering.ox.ac.uk/what-is-geoengineering/what-is-geoengineering/.

[287] Ibid.

[288] Karen N. Scott, "International law in the anthropocene: responding to the geoengineering challenge", *Michigan Journal of International Law*, vol. 34, No. 2 (2013), p. 322.

[289] Jennie C. Stephens, "Carbon capture and storage", http://www.eoearth.org/view/article/150922/.

[290] Ibid.

[291] Ibid.

[292] Intergovernmental Panel on Climate Change, "IPCC Special Report on Carbon Dioxide Capture and Storage", Working Group III. December 2005, p. 259. (For example the explosions in 2001 in Hutchinson, Kansas (USA), when compressed natural gas escaped from salt cavern storage facilities.) Available at www.ipcc.ch/pdf/special-reports/srccs/srccs_wholereport.pdf.

and storage in sub-seabed geological formations for permanent isolation.[293] In accordance with those regulations, CO_2 sequestration and export to other States is conditionally allowed for the purposes of sub-seabed storage.[294]

88. Marine geo-engineering, as "a deliberate intervention in the marine environment to manipulate natural processes", may be a useful technology for absorption of CO_2, but may also result in deleterious effects.[295] There are several types of marine geo-engineering.[296] The following two types of activities, namely "ocean iron fertilization" and "ocean alkalinity enhancement" are related to ocean dumping, and therefore to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 London Convention and the 1996 Protocol thereto (London Protocol). In 2008, the parties adopted a resolution stating that ocean fertilization activities, apart from legitimate scientific research, should not be allowed and urging States to use the "utmost caution and the best available guidance" even for scientific research.[297] Furthermore, in 2008, the Conference of the Parties to the Biodiversity Convention urged States to ensure that ocean fertilization activities would not take place until there was an adequate scientific basis on which to justify such activities and a "global transparent and effective control and regulatory mechanism is in place for these activities".[298] Another form of marine geo-engineering is "ocean alkalinity enhancement", which involves grinding up, dispersing, and dissolving rocks such as limestone, silicates, or calcium hydroxide in the ocean to increase its ability to store carbon and directly ameliorate ocean acidification.[299] The objective is to sequester CO_2 from the atmosphere by increasing the alkalinity (and the pH) of the oceans.[300] It

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[293] www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/CCS/Pages/default.aspx. These regulations include: 2012 Specific Guidelines for the Assessment of Carbon Dioxide for Disposal into Sub-seabed Geological Formations, adopted 2 November 2012 (LC 34/15, annex 8), available at www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/CCS/Documents/2012%20SPECIFIC%20GUIDELINES%20FOR%20THE%20ASSESSMENT%20OF%20CARBON%20DIOXIDE.pdf; Risk Assessment and Management Framework for CO2 Sequestration in Sub-Seabed Geological Structures (CS-SSGS) (Source LC/SG-CO2 1/7, annex 3), available at www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/CCS/Documents/CO2SEQUESTRATIONRAMF2006.doc; Resolution LP 3(4) on the Amendment to article 6 of the London Protocol (adopted on 30 October 2009), available at www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/CCS/Documents/Resolution%20LP-3(4).doc; Resolution on the amendment to include CO2 sequestration in sub-seabed geological formations in Annex 1 to the London Protocol, available at www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/CCS/Documents/LP1_1%20CO2.doc.

[294] Article 6, Annex 1, "Specific Guidelines for the Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations", in Annex 4 of IMO, "Report of the twenty-ninth consultative meeting and the second meeting of Contracting Parties", 14 December 2007, LC 29/17.

[295] Amendment to article 1 of the London Protocol, new para. 5 bis (LC 35/15, annex 4).

[296] C. M. G. Vivian, "Brief summary of marine geo-engineering techniques", available at www.cefas.defra.gov.uk/publications/files/20120213-Brief-Summary-Marine-Geoeng-Techs.pdf.

[297] Resolution LC-LP (2008) on the regulation of ocean fertilization, available from www.whoi.edu/fileserver.do?id=56339&pt=10&p=39373.

[298] Decision IX/16 on biodiversity and climate change, available from www.cbd.int/decision/cop/?id=11659. An exception was made for small-scale research activities within "coastal waters" for scientific purposes, without generation or selling carbon offsets or for any other commercial purposes. Naoya Okuwaki, "The London Dumping Convention and Ocean Fertilization Experiments: Conflict of Treaties surrounding Technological Development for CO_2 Mitigation", *Jurist*, No. 1409 (2010), pp. 38-46 (in Japanese).

[299] www.geoengineering.ox.ac.uk/what-is-geoengineering/what-is-geoengineering/.

[300] Haroon S. Kheshgi, "Sequestering atmospheric carbon dioxide by increasing ocean alkalinity", *Energy*, vol. 20, issue 9 (1995), pp. 915-922.

is geo-chemically equivalent to the natural weathering of rocks, which helps to buffer the ocean against decreasing pH and is thereby considered to help to counter ocean acidification.[301] That may pose legal problems similar to those of ocean fertilization, but has not yet been addressed by competent international bodies.

89. Solar radiation management is another form of geo-engineering. Its techniques are designed to mitigate the negative impacts of climate change by lowering earth surface temperatures through increasing the albedo of the planet or by deflecting solar radiation.[302] It has been estimated that a deflection of approximately 1.8 per cent of solar radiation would offset the global mean temperature effects of a doubling of atmospheric concentrations of CO_2.[303] There are several proposals in this area, such as "albedo enhancement" and "stratospheric aerosols". The former is a method for increasing the reflectiveness of clouds or the land surface, so that more of the heat of the sun is reflected back into space. That measure is thought by many to be risk-free, because it does not change the composition of the atmosphere. It only involves the utilization of white or reflective materials in urban environments to reflect greater amounts of solar radiation and therefore to cool global temperatures.[304] However, its effectiveness as a mitigation measure is not thought to be entirely satisfactory.[305] The stratospheric aerosols method is to introduce small, reflective particles into the upper atmosphere to reflect some sunlight before it reaches the surface of the Earth. However, there are some concerns over the injection of sulphate aerosols into the stratosphere. First, it is likely to increase the depletion of the ozone layer.[306] Second, it also has the potential to affect rainfall and monsoon patterns, with consequences for food and water supplies, especially in Africa and Asia.[307] Third, the option is not considered to be cost-effective as a climate change mitigation measure.[308]

90. Thus, while geo-engineering is a potential response to climate change, it has also been criticized as a rather deceptively alluring reaction to global warming issues, because it will reduce the incentive to cut greenhouse gas emissions.[309] It is in part a consequence of the perceived challenges of the climate change regime and the current

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[301] Ibid.

[302] Scott, "International law in the anthropocene: responding to the geo-engineering challenge", *Michigan Journal of International Law*, vol. 34, No. 2 (2013), p. 326.

[303] Ken Caldeira and Lowell Wood, "Global and Arctic climate engineering: numerical model studies", *Philosophical Transactions of the Royal Society* (Series A), vol. 366 (2008), pp. 4039, 4040.

[304] Hashem Akbari et al., "Global cooling: increasing world-wide urban albedos to offset CO_2", 94 *Climatic Change* (2009), pp. 275, 277; Robert M. Hamwey, "Active amplification of the terrestrial albedo to mitigate climate change: an exploratory study", *Mitigation and Adaptation Strategies for Global Change*, vol. 12 (2007), pp. 419-421.

[305] The Royal Society, "Geoengineering the Climate: Science, Governance and Uncertainty", at 34 (London, 2009), available at https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2009/8693.pdf.

[306] Simone Tilmes, et al., "The sensitivity of polar ozone depletion to proposed geoengineering schemes", *Science*, vol. 320 (2008), pp. 1201, 1204; Paul J. Crutzen, "Albedo enhancement by stratospheric sulfur injections: a contribution to resolve a policy dilemma?", *Climatic Change*, vol. 77, issues 3-4 (2006), pp. 211-220.

[307] Alan Robock et al., "Regional climate responses to geoengineering with tropical and Arctic SO2 injections", *J. Geophysical Res.* (16 August 16 2008), at 1.

[308] Marlos Goes, Nancy Tuana and Klaus Keller, "The economics (or lack thereof) of aerosol geoengineering", *Climate Change*, vol. 109 (2011), pp. 719, 720.

[309] Richard Black, "UK Climate Fix Balloon Grounded" (16 May 2012), http://www.bbc.com/news/science-environment-18086852; Johannes Urpelainen, "Geoengineering and global warming: a strategic perspective", *International Environmental Agreements: Politics, Law and Economics*, vol. 12, issue 4 (2012), pp. 375-389.

policies of focusing on emissions reductions that has led to geo-engineering becoming more attractive.[310] Given the imperfect knowledge of both the technologies and the climatic system, there are concerns about unintended environmental and ecosystem side effects. Some experts argue that while geo-engineering should remain on the table, it is important to begin developing international norms and legal rules to govern its usage in the future.[311] It has also been argued that there should be a thorough scientific review of geo-engineering by a competent organ, such as the Intergovernmental Panel on Climate Change, which may lead to the formation of a new international agreement to govern geo-engineering.[312] As a new law-making exercise, that is certainly beyond the task of the International Law Commission. However, among the examples of geo-engineering cited above, afforestation is well established within the Kyoto Protocol and weather modification is partially regulated by international law (the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques), and supplemented by the relevant General Assembly resolutions and UNEP guidelines. Ocean fertilization, as a form of marine geo-engineering, is in part under the control of the London Convention and Protocol, and is permitted only for scientific research. In 2010, the parties to the Biodiversity Convention also addressed all geo-engineering activities. It was decided, in line with the above-mentioned decision on ocean fertilization, that "no climate-related geo-engineering activities that may affect biodiversity take place, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the environment and biodiversity and associated social, economic and cultural impacts, with the exception of small scale scientific research studies that would be conducted in a controlled setting ... and only if they are justified by the need to gather specific scientific data and are subject to a thorough prior assessment of the potential impacts on the environment."[313] In addition, there are several notable non-binding guidelines proposed in the field: the recommendations of the Asilomar Conference on Climate Intervention Technologies convened by the United States Climate Institute in 2010;[314] the voluntary standards formulated in 2011 by the United States Bipartisan Policy Center's Task Force on Climate Remediation Research[315] and the Oxford Principles on Climate Geo-engineering Governance, elaborated by British academics in 2013.[316] Thus, it is clear

[310] Karen N. Scott, "International law in the anthropocene: responding to the geoengineering challenge", op. cit., p. 320.

[311] Johannes Urpelainen, "Geoengineering and global warming: a strategic perspective", op. cit., p. 378.

[312] Ibid. See also Scott Barrett, "The incredible economics of geoengineering", *Environmental and Resource Economics*, vol. 39 (2008), p. 53.

[313] Decision X/33 (2010), available from www.cbd.int/decisions/cop/?m=cop-10.

[314] The Asilomar Conference recommendations are: 1. Promoting collective benefit; 2. Establishing responsibility and liability; 3. Open and cooperative research; 4. Iterative evaluation and assessment; 5. Public investment and consent. www.climate.org/resources/climate-archives/conferences/asilomar/report.html.

[315] 2011-The Bipartisan Policy Center's Task Force on Climate Remediation Research elaborated the following principles: Principle 1: Purpose of climate remediation research; Principle 2: Testing and deploying climate remediation technologies; Principle 3: Oversight issues for research programs; Principle 4: Importance of transparency; Principle 5: International coordination; Principle 6: Adaptive management. http://bipartisanpolicy.org/library/task-force-climate-remediation-research/.

[316] The principles are as follows: 1. Geo-engineering to be regulated as a public good; 2. Public participation in geo-engineering decision-making; 3. Disclosure of geo-engineering research and open publication of results; 4. Independent assessment of impacts; 5. Governance before deployment (the five principles have equal status; numbering does not imply priority). See, Steve Rayner, et al., "The Oxford principles", Climate Geoengineering Governance working paper series No. 1 (University of Oxford, 2013), available from www.geoengineering-

that conducting geo-engineering will require "prudence and caution" (to use the words of the orders of the International Tribunal for the Law of the Sea),[317] even where such an activity is permitted, and that, in any event, prior assessment of geo-engineering activities should be made on a case-by-case basis in respect of each individual project. It is clearly a requirement of international law that environmental impact assessments are required for such activities as discussed at length earlier in the present report (paras. 41-60 above).

91. In view of the above, the following draft guideline is proposed:

Draft Guideline 7: Geo-engineering

Geo-engineering activities intended to modify atmospheric conditions should be conducted with prudence and caution in a fully disclosed, transparent manner and in accordance with existing international law. Environmental impact assessments are required for such activities.

IV. Conclusion

92. Having covered core substantive guidelines on the subject (namely, the obligations of States to protect the atmosphere and sustainable and equitable utilization of the atmosphere) in his third report in 2016, the Special Rapporteur wishes to suggest that the Commission deal in 2017 with the question of the interrelationship of the law of the atmosphere with other fields of international law (such as the law of the sea, international trade and investment law and international human rights law), and in 2018 with the issues of implementation, compliance and dispute settlement relevant to the protection of the atmosphere, by which time hopefully the first reading of the topic could be concluded that year, and the second reading in 2019.

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governance-research.org/perch/resources/workingpaper1rayneretaltheoxfordprinciples.pdf. See also, Chiara Armani, "Global experimental governance: international law and climate change technologies", ICLQ, vol. 64, No. 4 (2015), pp. 875-904.

[317] See the ITLOS orders on the provisional measures in the 1999 case *of Southern Blue Fin Tuna (New Zealand* v. *Japan; Australia* v. *Japan)* (para. 77), in the 2001 case of the *Mox Plant (Ireland* v. *United Kingdom)* (para. 84) and in the 2003 *Case concerning Land Reclamation by Singapore in and around the Strait of Johor (Malaysia* v. *Singapore)* (para. 99).

Annex

Draft guidelines proposed by the Special Rapporteur

Preamble

...

"Emphasizing the need to take into account the special situations of developing countries",

[Some other paragraphs may be added, and the order of paragraphs may be coordinated, at a later stage.]

Guideline 3: Obligation of States to protect the atmosphere

States have the obligation to protect the atmosphere from atmospheric pollution and atmospheric degradation.

(a) Appropriate measures of due diligence shall be taken to prevent atmospheric pollution in accordance with the relevant rules of international law.

(b) Appropriate measures shall be taken to minimize the risk of atmospheric degradation in accordance with relevant conventions.

Guideline 4: Environmental impact assessment

States have the obligation to take all such measures that are necessary to ensure an appropriate environmental impact assessment, in order to prevent, reduce and control the causes and impacts of atmospheric pollution and atmospheric degradation from proposed activities. Environmental impact assessment should be conducted in a transparent manner, with broad public participation.

Guideline 5: Sustainable utilization of the atmosphere

1. Given the finite nature of the atmosphere, its utilization should be undertaken in a sustainable manner.

2. For sustainable utilization of the atmosphere, it is required under international law to ensure a proper balance between economic development and environmental protection.

Guideline 6: Equitable utilization of the atmosphere

States should utilize the atmosphere on the basis of the principle of equity and for the benefit of present and future generations of humankind.

Guideline 7: Geo-engineering

Geo-engineering activities should be conducted with caution and prudence in a fully disclosed, transparent manner and in accordance with existing international law. Environmental impact assessments are required for such activities.

Guideline 8 [5]: International cooperation

Draft guideline 8 would be draft guideline 5, as provisionally adopted by the Commission in 2015.